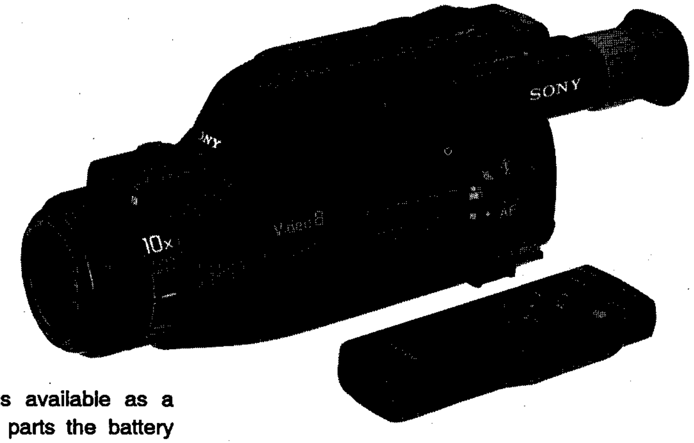
CCD-FX400/FX410/FX411
RMT-509

SERVICE MANUAL

US Model
CCD-FX410/FX411

Canadian Model
CCD-FX410

E Model
CCD-FX400



Video 8
Handycam

A MECHANISM

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only avaiable.

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 1.43 cm (19/32 inch)/sec. LP mode: Approx. 0.72 cm (5/16 inch)/sec. (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours (P6-120) LP mode: 4 hours (P6-120)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 x power zoom lens f=6.1 to 61 mm (1/4 to 2 1/2 inches) Approx. 44 to 440 mm (1 3/4 to 17 3/8 inches) converted into the focal length of a 35-mm still camera. F 1.6 with macro Filter diameter: 37 mm (1 1/2 inches) TTL autofocus system inner focus wide macro system
Color temperature	AUTO
Minimum illumination	2 lux
Illumination range	2 lux to 100,000 lux (0.2 to 9294 footcandles)
Recommended illumination	More than 100 lux (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connector

Video input/output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	Phono jack Input: –7.5 dBs, input impedance more than 47 kilohms Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 1 kilohms
RFU DC OUT	Special minijack, 5V DC
Earphone jack	Minijack, 8-ohm impedance
Remote ᑕ jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.5 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) ($4\frac{3}{4} \times 4\frac{3}{8} \times 10\frac{1}{2}$ in.)
Weight	Approx. 820 g (1 lb 13 oz) excluding the battery pack, lithium battery, and cassette Approx. 1012 g (2 lb 3 oz) including the battery pack NP-55H, lithium battery CR2025, and cassette P6-120
Microphone	Electret condenser microphone, uni-directional, monaural type

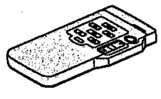
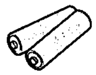
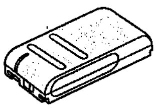
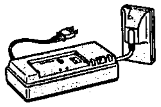
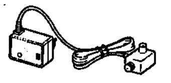
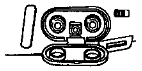
Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 48 × 19 × 130 mm (w/h/d) ($1\frac{15}{16} \times \frac{3}{4} \times 5\frac{1}{8}$ inches)
Weight	Approx. 50 g (1.8 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Checking Supplied Accessories

Please check that the following accessories are supplied with your camcorder.

• Wireless Remote Commander (1) 	• Size AA (R6) battery for Remote Commander (2) 	• Battery pack NP-55H (1) 
• AC power adaptor AC-V60A (1) 	• Lithium battery CR2025 (1) 	• RFU adaptor RFU-90UC (1) 
• Shoulder strap (1) 	• Lens cap (1) (attached to the camcorder) 	• Jack cover (1) (attached to the camcorder) 

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

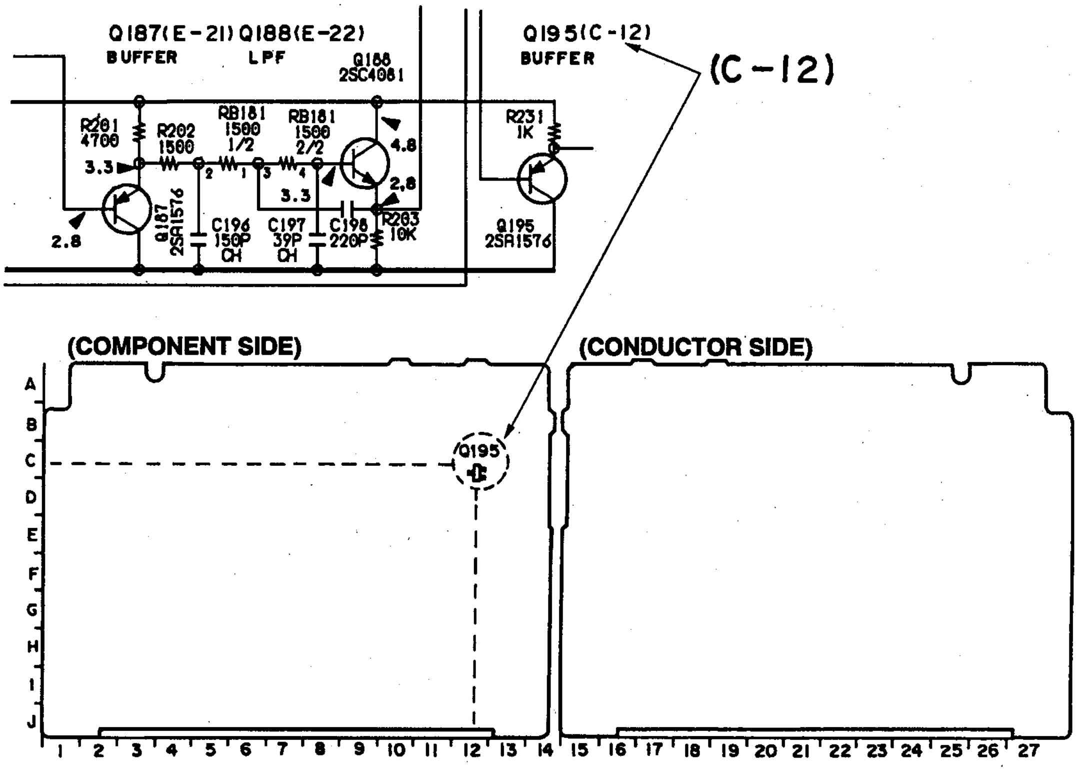
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 101 and 122.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
2.8
4.8
2.8
3.3
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
(C-12)
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
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F
G
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J
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)

SECTION 1
GENERAL

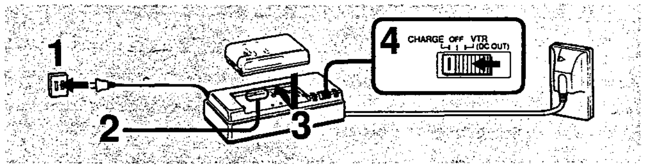
This section is extracted from instruction manual.

Chapter1:GettingStarted

Charging and Installing the Battery Pack

Before you can use this camcorder, you need to charge and install the battery pack.

Charging the Battery Pack



1 Plug the AC power adaptor into a wall outlet.
2 Align the flat side of the battery pack with the line on the AC power adaptor.
3 Push down and slide the battery pack in the direction of the arrow.
4 Set the CHARGE/VTR switch to CHARGE.

Required charging time:

Type of battery pack	NP-55H (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55
Required charging time	70	140	120	110	60

(approx. minutes using AC-V60A)

When charging is finished, the charge indicator will go out.

Important!

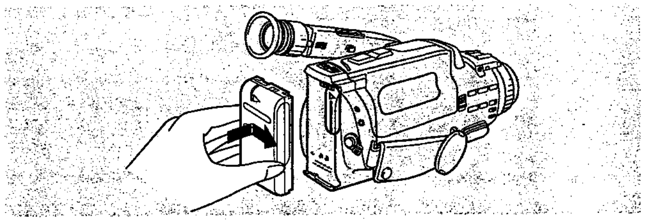
Use the battery completely before charging!

Before you recharge the battery, make sure the battery has been used (discharged) completely to avoid capacity down of the battery caused by excessive charging.

To use up the battery. remove the video cassette and simply slide POWER to CAMERA with the battery attached, and leave the camcorder until the ▭ indicator appears blinking and a red lamp blinks in the viewfinder.

Installing the Battery Pack

When you have finished charging the battery, install the battery pack as follows:

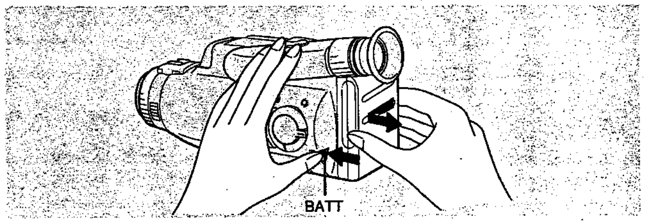


1 Align the flat side of the battery pack with the white line on the camcorder.
2 Make sure that the arrow on the battery pack is close to the top of the camcorder.
3 Push down and slide the battery pack in the direction of the arrow.

Notes
- Make sure the battery is securely installed so that it does not fall. If the battery is not installed properly, the camcorder will not record accurately.
- You can use the AC power adaptor as a power source when recording indoors.

To remove the battery pack

Slide BATT in the direction of the arrow, and at the same time, slide out the battery pack to the left.



Charging and Installing the Battery Pack

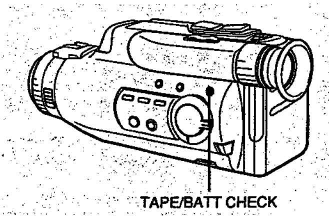
Battery life and remaining capacity

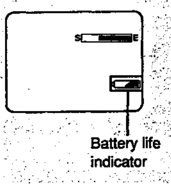
A fully charged battery pack lasts for:

Type of battery pack	NP-55H (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55
Battery life	75	150	120	110	60

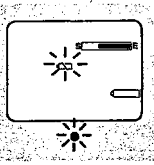
(approx. minutes, continuous recording when used indoors)

To check the remaining battery capacity, press TAPE/BATT CHECK.





The decreasing black bar indicates decreasing battery power. After the black bar disappears the ⊏⊐ indicator will appear and blink and a red lamp will also blink in the viewfinder. When they blink rapidly, replace the battery pack.



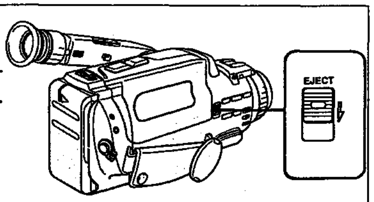
Note The battery life indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack.

Inserting a Tape

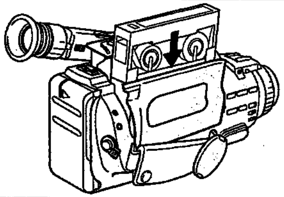
Make sure that the battery pack or other power source is attached.

1 Press the small blue button on EJECT and simultaneously push EJECT in the direction of the arrow.

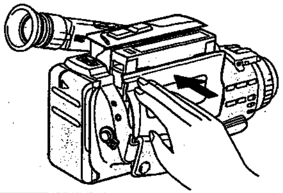
The cassette compartment automatically lifts up and opens toward you.



2 Insert a tape with the window facing outside.

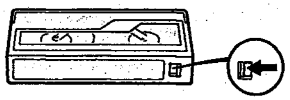


3 Close the cassette holder by pressing the area marked "PUSH".



Preventing Accidental Erasure

Slide the tab on the cassette to expose the red mark. This will prevent accidental recording.
To re-record on this tape, slide the tab back out covering the red mark.
If you try to record with the red mark exposed, the ⊡ and ≜ indicators blink in the viewfinder and you will hear beep sound for about five seconds.

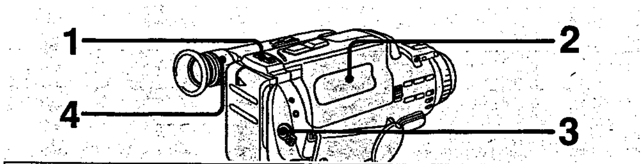


Note on handing tapes

Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of tape, or if the red mark is exposed or covered, etc. Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

Adjusting the Viewfinder Lens

You may want to adjust the viewfinder lens to best fit your eyesight when you use this camcorder for the first time, or when you use it after someone else did. Make sure that a battery pack or other power source is attached to the camcorder.

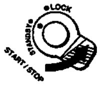


1 **Press the small green button on POWER and slide POWER to CAMERA.**

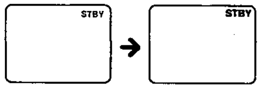
CAMERA
OFF
VTR
POWER

2 **Insert a tape.**
(See page 9.)

3 **Turn STANDBY up.**



4 **Turn the viewfinder adjustment ring around the viewfinder lens until the "STBY" indicator displayed in the viewfinder screen comes into sharp focus.**



Using the viewfinder as a sports finder

This camcorder is equipped with a Sports Finder. You can use the viewfinder as the sports finder by turnig the viewfinder adjustment ring.

What is a sports finder ?

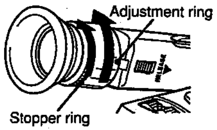
Since this finder has a long focal length, you can monitor the picture while your eye is at a distance from the eyecup. The sports finder is convenient when moving around to shoot scenes.

To set the viewfinder to the sports finder position

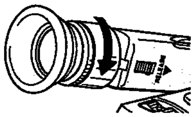
Turn the viewfinder adjustment ring clockwise completely.

To go from the sports finder position to the normal viewfinder position quickly

1 **When turning the adjustment ring to set the viewfinder to the normal viewfinder position, turn the stopper ring at the same time.**



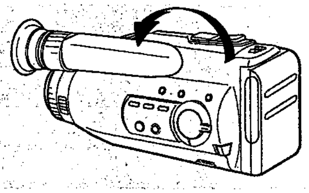
2 **To set the viewfinder to the sports finder position, turn only the adjustment ring clockwise completely.**



3 **To go from the sports finder position to the normal position, rotate the adjustment ring counterclockwise.**
The adjustment ring stops where the stopper ring has stopped. It is possible to shift quickly between the normal viewfinder position and the sports finder position.

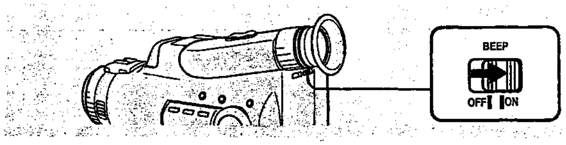
When storing the camcorder

Turn the viewfinder barrel to the front.



Setting the BEEP Switch

This beep sound is to help you cofirm when you start and stop recording.
When BEEP is set to ON, it will beep once when you start recording and beep twice when you stop recording.
It will also beep several times as a warning of any unusual conditions of the camcorder.
If you want to deactivate the beep, set BEEP to OFF.

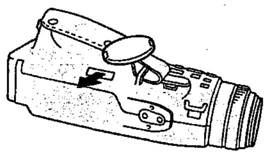


Notes
- If the battery has been installed, remove it.
  Reattach the battery after setting the BEEP ON/OFF switch.
- Beep will not be recorded on the tape.
- For warning beep, see page 72.

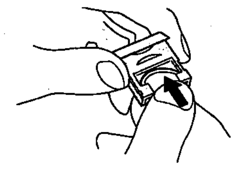
Installing the Lithium Battery

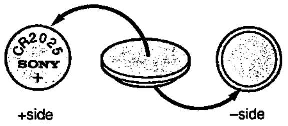
To keep birth dates in the camcorder's memory as well as to activate the clock, lithium battery must be installed.

1 **Remove the lithium battery holder located at the bottom of the camcorder.**



2 **Install the supplied CR2025 lithium battery with the + side facing down.**





3 **Put the lithium battery holder into the camcorder.**

Lithium battery life

The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ♨ indicator will blink in the viewfinder screen for about 5 seconds when you set POWER to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025. Use of any other battery may present a risk of fire or explosion.**

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time and birth dates will be necessary.

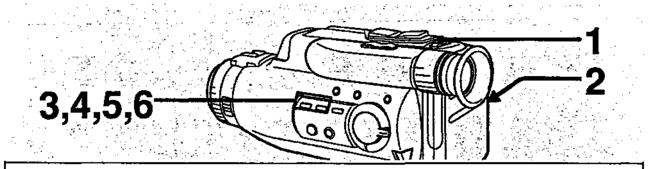
To change the lithium battery

Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Warning Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Setting the Date and Time

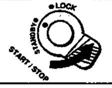
Now, let's adjust the clock inside the camcorder to be able to superimpose date and time onto your video.
Make sure that power source and lithium battery are attached.



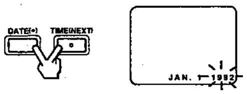
1 **Press the small green button on POWER and slide POWER to CAMERA.**

CAMERA/OFF VTR
POWER

2 **Turn STANDBY up.**

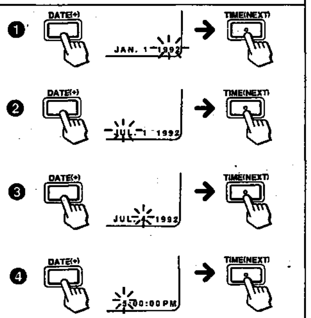

LOCK
STANDBY
START/STOP

3 **Press DATE (+) and TIME (NEXT) simultaneously for a few seconds until the date indicator appears in the viewfinder.**
DATE button now functions as + (to advance numbers) and TIME button functions as NEXT (to set).

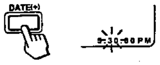

DATE(+)
TIME(NEXT)
JAN. 1 1992

4 **Adjust the flashing digits of the year, month, day, and hour using DATE (+), and press TIME (NEXT).**

Notes
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992 and proceeds as follows:
  1992 ---→ 1999 → 2000 ---→ 2020


❶
DATE(+)
JAN. 1 1992
TIME(NEXT)
❷
DATE(+)
JUL 1 1992
TIME(NEXT)
❸
DATE(+)
JUL 4 1992
TIME(NEXT)
❹
DATE(+)
5:00:00 PM
TIME(NEXT)

5 **Adjust the flashing digits of minute using DATE (+).**


DATE(+)
5:30:00 PM

6 **Press TIME (NEXT) to set the second to "00".**
The clock starts operating.

To correct date and time setting
Repeat steps 3 to 6.

Storing a Birth Date in Your Camcorder

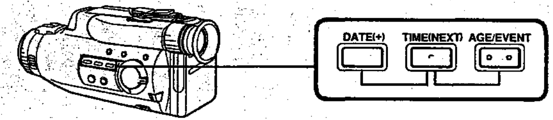
When you preset your child's birth date in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update age of your child. You can superimpose the age anytime on your recording. You can preset up to three birth dates or events.

Before you begin

Before you store a birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

How to store birth date

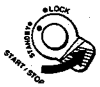
To store a birth date in your camcorder, see the following example and procedure.
Example: Store "Aug. 3, 1987" in memory 2.


DATE(+)
TIME(NEXT)
AGE/EVENT

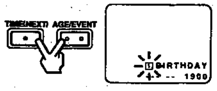
1 **Press the small green button on POWER and slide POWER to CAMERA.**

CAMERA/OFF VTR
POWER

2 **Turn STANDBY up.**


LOCK
STANDBY
START/STOP

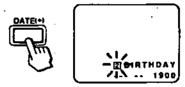
3 **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the "1 BIRTHDAY-- --1900" indicator appears in the viewfinder.**


TIME(NEXT)
AGE/EVENT
1 BIRTHDAY
-- 1900

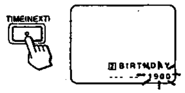
4 **Press DATE (+) to select 2.**
Each time you press DATE (+), the display in the viewfinder changes as follows:

1 BIRTHDAY → 2 BIRTHDAY
↑—— 3 EVENT* ←——

* Although "EVENT" is displayed on 3, you can use it for age as well.
1 and 2 can also be used for event.


DATE(+)
2 BIRTHDAY
-- 1900

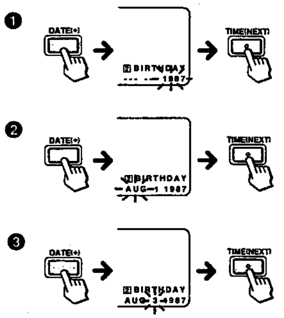
5 **Press TIME (NEXT).**
The "1900" indicator blinks.


TIME(NEXT)
2 BIRTHDAY
--- 1900

(To be continued)

6 **Enter the birth date of your child.**

First adjust the blinking digits with DATE (+), and then press TIME (NEXT).
The age (year and month) appears when all the items are adjusted.


❶
DATE(+)
BIRTHDAY
1987
TIME(NEXT)
❷
DATE(+)
BIRTHDAY
AUG-1 1987
TIME(NEXT)
❸
DATE(+)
BIRTHDAY
AUG-3 1987
TIME(NEXT)

If you missed the correct number with DATE (+)

Keep pressing DATE (+).
The indicator changes as follows:

Year: 1900 → 1901 - - - → Current year
Current year – (minus) 99

Month: JAN. → FEB. - - - → DEC. → ---

Day: 1 → 2 - - - → 31

To correct/change the setting

Follow the procedures from step 1 again.

To advance the digits faster

Keep DATE (+) pressed.

To preset the year before 1900

1 After step 5 on page 15, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1992 → 1893)
3 Go to step 6 above.

When in 2000

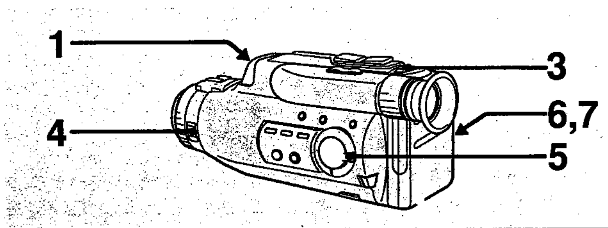
"--- --1901" is displayed in step 3 on page 15. After that, it advances every year as "1902, 1903, ... ".

Now it's ready for recording!

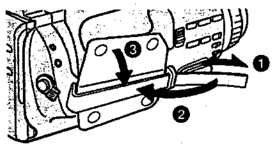
How to Record

Before you record one-time events, make a trial recording to make sure that the camcorder is working perfectly.
Keep the lense clean, or the focus cannot be adjusted properly.

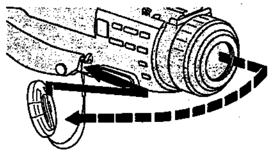
It is very easy to start recording scenes.



1 **Hold the camcorder by putting your hand through the grip belt so that your thumb can easily press the red START/STOP button.**

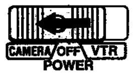


2 **Remove the lens cap and attach it to the grip belt.**

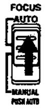


3 **Press the small green button on POWER and slide POWER to CAMERA.**

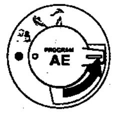
This puts the camcorder in the camera recording mode.


CAMERA
OFF
VTR
POWER

4 **Set FOCUS to AUTO.**

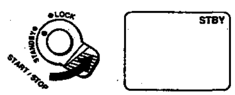

FOCUS
AUTO
MANUAL
PUSH AUTO

5 **Set PROGRAM AE to the green position.**

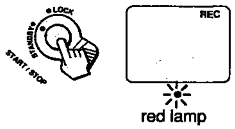


(To be continued)

6 **Turn STANDBY up.**
"STBY" appears in the viewfinder. Now, you can see through the viewfinder.



7 **Press START/STOP (red button) once.**
The camera is recording when the word "REC" appears on the viewfinder screen and the red lamp lights in the viewfinder. You can also confirm the start of recording with beep sound when you have the BEEP switch turned on.



In the viewfinder you can see a black and white picture of what you are recording and information that indicates what the camcorder is now doing.

Automatic recording

With PROGRAM AE set to the green position and FOCUS set to AUTO, all the camera functions are on automatic (i.e. auto iris, auto white balance, auto focus) and the shutter speed is set at normal (1/60 second.)

To stop recording momentarily

Press START/STOP again. "STBY" appears in the viewfinder. It beeps twice when you have BEEP turned on.

When you have finished recording

Turn STANDBY down and slide POWER to OFF.

Ejecting the tape

Make sure that you have attached the battery pack or other power source to the camcorder.

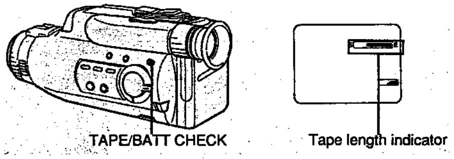
1 Press the small blue button on EJECT, and at the same time push EJECT in the direction of the arrow.
2 Take out the tape.
3 Press the PUSH mark on the cassette holder to close it.

Caution!

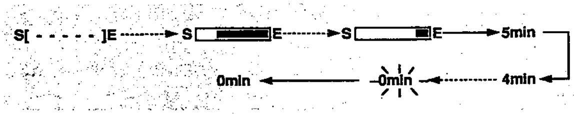
Please remember that you can only use 8-mm format video tapes with this camcorder, and that is not possible to use PCM recording/playback available on some 8 mm recorders. The PCM sound recorded or after-recorded with other recorder cannot be played back with this camcorder.
You will be able to record tapes in SP (standard play) mode only and play back tapes in both SP and LP (long play) modes.

To check the time remaining of the tape

Press TAPE/BATT CHECK.



After pressing TAPE/BATT CHECK, the time remaining may not be indicated for about 20 seconds. When the time remaining is less than about 5 minutes, the indicator indicates the minutes remaining.



When "5 min" lights, the ▣ indicator appears in the viewfinder and blinks.

Note on the tape length indicator

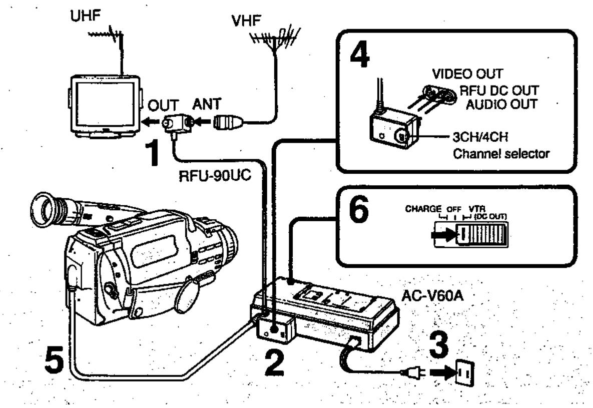
- The camcorder must be in the recording or playback mode when the TAPE/BATT CHECK is pressed to find out the time remaining. In the playback mode, however, the indicator does not indicate the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

How to Play Back a Tape

You can use this camcorder as a VCR by connecting it directly to your TV for playback. After you connect this camcorder to your TV, use the Remote Commander for convenient control of the camcorder.

If Your TV Has Only an Antenna Input

There are several ways to connect the camcorder to your TV. If your TV has only an antenna input, use the supplied RFU adaptor and AC power adaptor. Make sure that the TV is turned off to prevent speaker damage before hooking up your camcorder.
If your TV has video/audio inputs, see page 47.



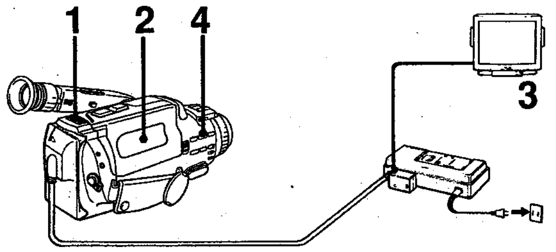
To add your camcorder connection to your TV which is already connected with regular TV (VHF) antenna, you need to:

1 Unplug the antenna cable from your TV first.
  Plug in the tail end of the RFU adaptor marked OUT to the antenna input of your TV. Re-wire the antenna cable you unplugged to the RFU adaptor jack marked ANT. This way, you can switch between TV broadcasting and your home video playback without re-wiring.
2 Connect the RFU adaptor to the AC power adaptor.
3 Connect the AC power adaptor to a wall outlet.
4 Set the channel selector on the RFU adaptor (and your TV channel) to 3 CH or 4 CH of the VHF channel, whichever is not active (vacant) in your area.
5 Attach the connecting plate of the AC power adaptor to the camcorder.
6 Make sure the CHARGE/VTR selector on the AC power adaptor is set to VTR position.

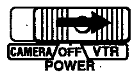
You may want to keep the AC power adaptor and RFU adaptor connected to your TV once you have established the connection. This way, you can easily connect your camcorder to your TV just by attaching the connecting plate of the AC power adaptor to the camcorder. (Steps 5 and 6)

When you want to switch to regular TV program, set the CHARGE/VTR selector to OFF or turn off the power of the camcorder.

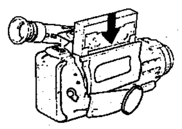
How to Play Back a Tape



1 **Press the small green button on POWER and slide POWER to VTR.**



2 **Insert a tape, if it is not in the camcorder.**



3 **Turn on the TV and select the channel that you adjusted the RFU adaptor (3 CH or 4 CH).**
If you are connecting with video/audio inputs, set TV's TV/VIDEO selector to VIDEO.

4 **Press ▷ (PLAY).**

To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

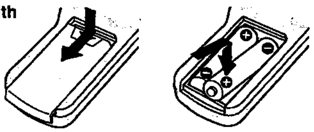
When you have finished playback

1 Slide POWER to OFF.
2 Set CHARGE/VTR on the AC power adaptor to OFF.

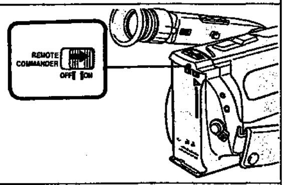
Using the Remote Commander

By using the Remote Commander, you can be in the picture with your friends and family, or conveniently control the playback of your tape from a distance.

1 Insert two size AA (R6) batteries with correct polarity.



2 Set ▣ REMOTE COMMANDER ON/OFF on the battery mounting surface of the camcorder to ON.

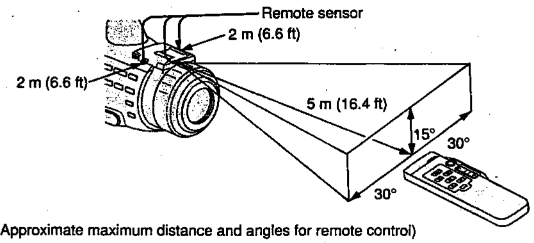


If the battery is attached, remove it.
Reattach the battery after setting the REMOTE COMMANDER ON/OFF switch.

3 Set POWER on the camcorder as follows:

- — When camerarecording, 1) press the small green button on POWER and slide POWER to CAMERA, 2) turn STANDBY up.
- — When playing back, slide POWER to VTR.

4 Point the Commander to the remote sensor of the camcorder and press the appropriate button on the Commander.

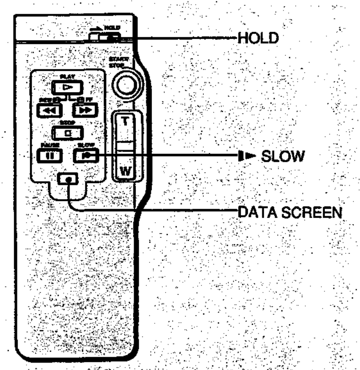


(Approximate maximum distance and angles for remote control)

Note on the Remote Commander

- Keep the remote sensor away from the strong light source such as direct sunlight or illumination. Remote control with the Commander may not be effective.
- The command mode of the Commander is VTR2. Avoid to use the Sony VCRs with the same command mode at the same time.

Getting familiar with some buttons



HOLD switch
When you slide the switch in the direction of the arrow, all the buttons will become inoperable to prevent any misoperation when you accidentally press the buttons.

▶ SLOW and DATA SCREEN buttons
You can use the functions of these buttons only with the Commander.

Battery life

In normal operation, batteries will last up to six months. If the camcorder does not operate properly, the batteries might be exhausted. Replace both batteries with new ones.

To avoid damage from possible battery leakage

Remove the batteries when you will not use the Commander for a long time.

When you connect the receiver of a remote control kit

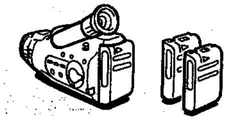
When you connect the receiver of a remote control kit (not supplied) to the REMOTE ⏎ control connector, be sure to set ▣ REMOTE COMMANDER ON/OFF on the battery mounting surface of the camcorder to OFF.

How to Get the Most out of Your Battery Pack

How to Prepare the Rechargeable Battery Pack

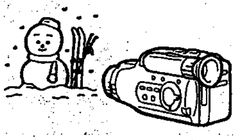
Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned.

"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.



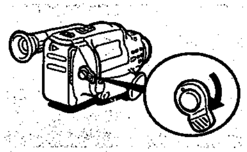
Battery life is shorter in a cold climate.

Battery efficiency is decreased and the battery will be used up more quickly.



Turn STANDBY of the camcorder down when not recording to save battery power.

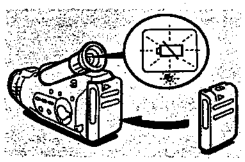
A smooth transition between scenes can be made even if recording is stopped and started again. While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically inside the camcorder and the battery is used. The battery is also used when a tape is inserted or removed.



When the Rechargeable Battery Pack Should Be Replaced

When the 🔋 indicator and red lamp in the viewfinder change from slow blinking to rapid blinking while you are recording.

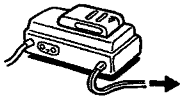
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth transition between scenes after the battery pack is replaced.



Notes on Charging

Before using the battery pack, charge it sufficiently.

A brand new battery pack is not charged.



Make sure you use up the battery before recharging.

- If recording is completed before the 🔋 indicator appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, turn STANDBY up, and leave the camcorder until the 🔋 indicator blinks rapidly.
- When you use the AC-S10 AC power adaptor, the DC-S10 car battery charger or BC-S10 portable battery charger, you can discharge the battery with their discharging function.
- Repeated charging without using up the battery may cause lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge (use up) and charge the battery again.

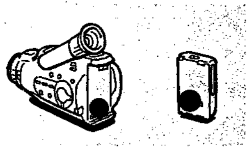
Recharge the battery pack after long storage.

If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

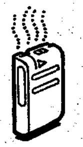
If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition.
Also, wipe the + and – terminals with a soft cloth or paper.



Notes on the Rechargeable Battery Pack

Why the battery pack heats up?

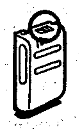


During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack, and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is in the camcorder, a small amount of current flows to the camcorder even if POWER is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery right before using.

How to use the switch on the battery pack



This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

How many times can the battery pack be recharged?

It can be fully charged and discharged about 500 times under normal temperatures. If the ▭ indicator blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Recommended temperatures during charging

Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C (5°F to 85°F) is recommended.

Connecting Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (see page 7), house current, and 12/24 V car battery.
The appropriate power source for you to choose depends on the place where you want to use your camcorder.

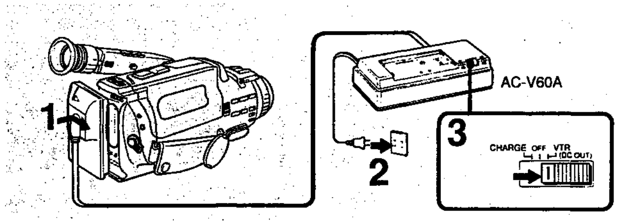
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55H (supplied), NP-77H/77HD, NP-77, NP-66H or NP-55
Indoors	House current	AC power adaptor AC-V60A (supplied), AC-V30 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77

Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case, supply the power again immediately.

Using House Current

The supplied AC-V60A AC power adaptor is required.



1 **Align the flat side of the connecting plate with the white line on the camcorder, and push down and slide it in the direction of the arrow.**

2 **Connect the AC power adaptor to a wall outlet.**

3 **Set the CHARGE/VTR selector of the AC power adaptor to VTR.**

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate

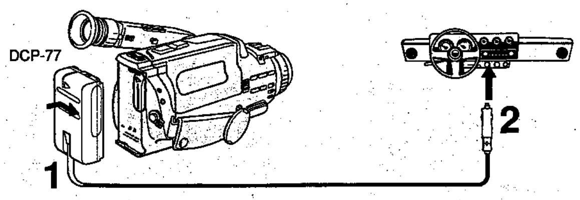
Remove it the same way as you do with the battery pack. See page 7.

Option AC-S10 AC power adaptor:
You can charge a battery, as well as discharge it to get the optimum condition of the battery.

Connecting Alternative Power Sources

Using Car Battery

The DCP-77 DC pack (not supplied) is required.



1 **Align the flat side of the DC pack with the white line on the camcorder, and push down and slide it in the direction of the arrow.**

2 **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack

Remove it the same way as you do with the battery pack. See page 7.

Options

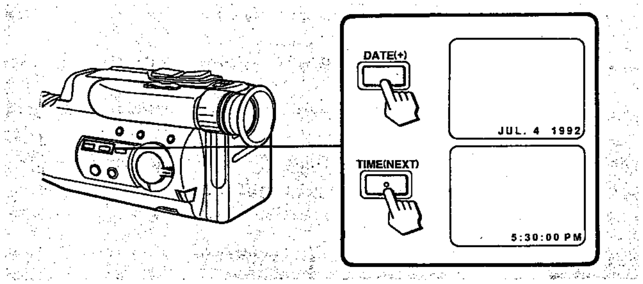
- BC-77, BC-S10 portable battery charger:
  You can charge a battery pack on 100 – 240 V AC. BC-S10 has discharging function, so you can charge a battery pack whether it is used up or not.
- DC-S10 car battery charger with discharging function:
  You can charge a battery pack through the cigarette lighter socket.

Camera Recording

In the previous chapter "Basic Camera Operation", you learned the basic recording operations. This section shows you how to record the date or time, record an age, re-record a picture and more.

Recording the Date or Time

Date or time can be superimposed on your recording.



During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.

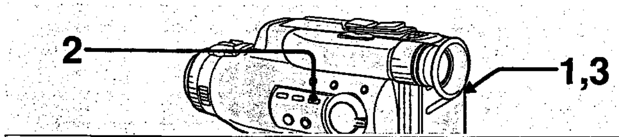
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time

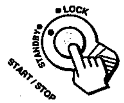
Press DATE or TIME again.
The picture recording continues.

Putting an Age on Your Tape

Here's how to put the age of your children in your video while recording.



1 **During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.**
This puts the camcorder in the standby mode.

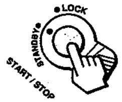


2 **Press AGE/EVENT to select the indicator you want to record.**
Each time you press AGE/EVENT, the indicator changes as follows:

$$\begin{tikzcd} \text{No indicator} \arrow[r] & \boxed{1}\text{ The first age} \arrow[d] \\ \boxed{3}\text{ The third age} \arrow[u] & \boxed{2}\text{ The second age} \arrow[l] \end{tikzcd}$$

An item with no presetting is skipped.
The $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indicator goes out after one second.

3 **Press START/STOP.**
Recording starts again.
The indicator in the viewfinder is recorded with the picture.



Note
You cannot add the age later during playing back or editing.

To stop recording the age

Press AGE/EVENT until the indicator goes out.

To change the display while recording

Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you select starts when $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ goes out.

To cancel the stored birth date

1 Perform steps 1 to 4 in "Storing a Birth Date in Your Camcorder" on page 15, to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indicator blinks.
3 Press DATE (+) until "--- --" appears.
4 Press TIME (NEXT).

The birth date is deleted from the memory and is not displayed when you press AGE/EVENT.

About memory back-up

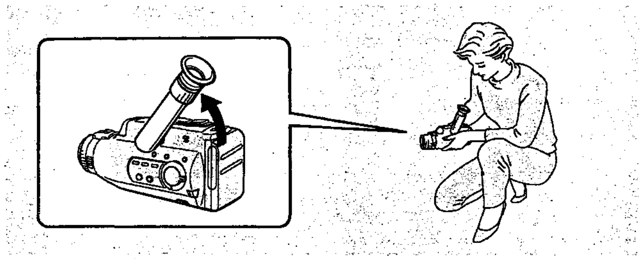
The camcorder uses the lithium battery on the bottom to keep the birth date in memory. The lithium battery life is approximately 1 year.

When you connect the camcorder to a TV during recording

If you do not use the data-screen function by the Remote Commander, the age indicatior will appear on the TV screen when the $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indicator goes out in the viewfinder and recording starts.

For Low-position Recording

You can also record from low position to get an interesting recording angle.

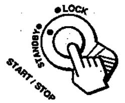


Set the viewfinder to the sports finder position (page 10) and turn it for the low position recording. (It can be turned 180 degrees.)

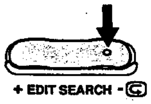
Checking the Last Portion of a Scene You Just Recorded (EDITSEARCH)

You can check the last portion of a scene you just recorded without changing the setting of the POWER switch using EDITSEARCH.

1 **Put the camcorder in the standby mode by pressing the START/STOP button.**

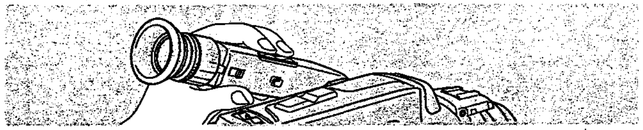


2 **Press the – ⊜ side of EDITSEARCH momentarily.**
The last few seconds of the recorded portion will be played back in the viewfinder. After a few seconds of playback, the camcorder goes back to the standby mode, ready for the next recording.



Note on using EDITSEARCH

When you raise the viewfinder and use EDITSEARCH, hold the viewfinder with your thumb to prevent movement.



Hints for Recording

If the tape reaches near the end during recording

The 📼 indicator and the red lamp in the viewfinder and the camera recording/battery lamp on the camcorder blink slowly. When the tape reaches its end, blinking becomes rapid and beeps sound for about five seconds (if BEEP is set to ON.)

Notes on recording

- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, turn STANDBY up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode

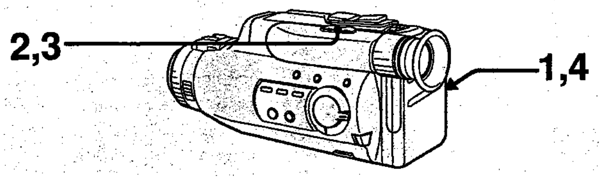
If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume the standby mode, turn STANDBY down and turn it up again. To start recording, press START/STOP directly.

Note on light sources

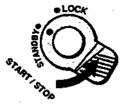
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

Re-recording on a Previously Recorded Portion (EDITSEARCH)

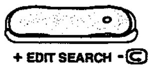
You can reshoot a scene over the last recorded portion using EDITSEARCH. The previously recorded portion will be erased.



1 **Turn STANDBY up.**

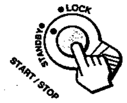


2 **Look in the viewfinder and find the point from where you want to begin recording by:**
Keep pressing the + side of EDITSEARCH continuously to advance the picture at a normal playback speed, or the – side to reverse the picture.



3 **At the desired point, release EDITSEARCH.**

4 **Press START/STOP.**
Recording begins from the point you released EDITSEARCH.
A smooth transition between scenes can be made after the pre-recorded portion even if STANDBY is turned down and turned up, or even if the power is turned off and on again, provided that the tape is not removed.



To pause recording

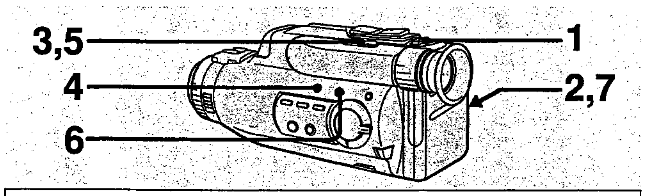
Press START/STOP again.

To stop recording

Turn STANDBY down.

Inserting Scene in the Middle of a Recorded Tape

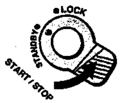
You can insert a scene in the middle of a recorded tape by setting the starting point and ending point. A previously recorded portion will be erased.



1 **Press the small green button and slide POWER to CAMERA.**

CAMERA/OFF VTR
POWER

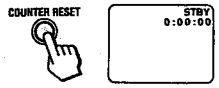
2 **Turn STANDBY up.**


LOCK
STANDBY
START/STOP

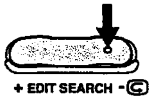
3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**
The camcorder enters the standby mode again.

+ EDIT SEARCH -

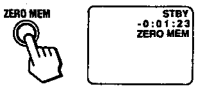
4 **Press COUNTER RESET.**
The counter is reset to zero.


COUNTER RESET
STBY
0:00:00

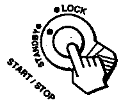
5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**


+ EDIT SEARCH -

6 **Press ZERO MEM.**
The insert ending point is stored in memory.


ZERO MEM
STBY
-0:01:23
ZERO MEM

7 **Press START/STOP.**
Insert recording begins. The insert recording stops automatically at the counter zero point.

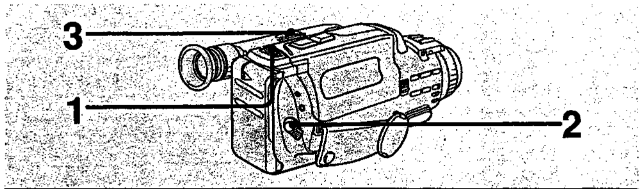

LOCK
STANDBY
START/STOP

To cancel the ZERO MEM
Press ZERO MEM.

Note The picture may be distorted at the ending point when played back.

Checking Recording in the Viewfinder (EDITSEARCH)

You can check the recorded picture in the viewfinder using EDITSEARCH. Sound cannot be monitored.



1 **Press the small green button, and slide POWER to CAMERA.**

CAMERA/OFF VTR
POWER

2 **Turn STANDBY up.**

LOCK
STANDBY
START/STOP

3 **Keep pressing the + or – side of EDITSEARCH to view the playback picture:**
+ side for the playback picture
– side for the playback picture in reverse.

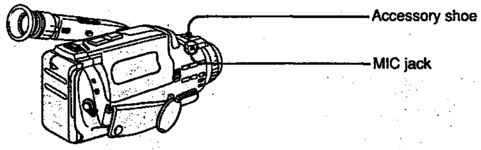
+ EDIT SEARCH -

To stop playback
Release EDITSEARCH.

To monitor the sound while viewing the playback picture in the viewfinder
1 Connect an earphone to the ● (earphone) jack.
2 Press the small green button and slide POWER to VTR.
3 Press ◀◀ to rewind the tape and press □ where you want to stop.
4 Press ▷ to start playback.

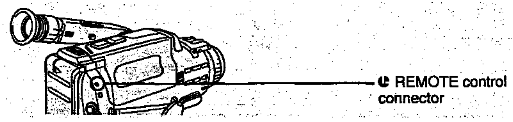
Recording with an External Microphone

You can connect an external microphone (not supplied) to the MIC jack. This jack also accepts a "plug-in-power" microphone.
Attach the microphone to the accessory shoe of the camcorder.



Connecting a Wired Remote Control Unit

When you connect a wired remote control unit or editing controller (not supplied) to the Ⓛ REMOTE control connector, you can operate your camcorder from a distance.



About Ⓛ (LANC)

Ⓛ stands for Local Application Control Bus System. The Ⓛ connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

Making Manual Adjustments

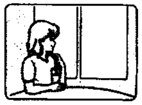
The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording.
You can manually adjust focus and back light compensation with this camcorder.
Some shooting situations may call for using some items manually, while others call for using them automatically.
As long as you do not remove the battery, even if you set POWER to OFF, the previous manual settings are retained.

Focusing Manually

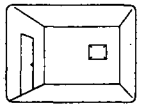
When to use *manual focus*

In the following cases you would obtain better results by adjusting the focus manually.

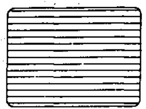
Too much brightness behind the subject



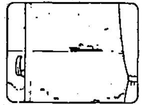
Subjects with little contrast-wall, sky, etc.



Horizontal stripes



Subject through frosted glass

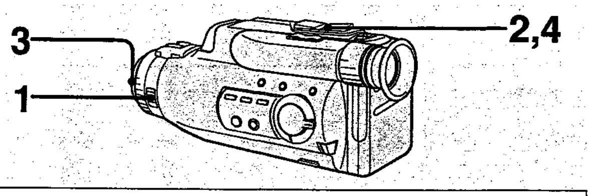


- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder
- Bright subject or subject reflecting light
- High contrast behind the subject (the background may be focused)
- When shooting a stationary subject using tripod
- When you want to save battery power
- Autofocusing does not function momentarily when:
  - – The setting of the shutter speed is changed.
  - – Exposure is adjusted manually.
  - – Lighting conditions change quickly.
  - – Zooming is done from wide-range to telephoto.

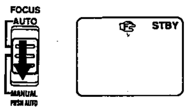
This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

How to focus manually

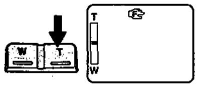
When adjusting focus manually, the best way is to first adjust at telephoto position before recording, then set the desired zoom angle.
Let's go through step by step.



1 **Set FOCUS to MANUAL.**
The ☞ indicator appears in the viewfinder.

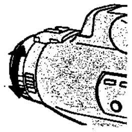


2 **Keep pressing the T side (telehpoto) of the power zoom button until the zooming stops.**
The power zoom indicator appears in the viewfinder.



3 **Turn the focus ring to achieve sharp focus.**

Note
The focus ring does not have a stop position.



4 **Set the desired shot length using the power zoom button.**

Shooting with autofocusing momentarily

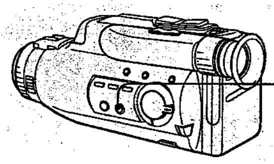
While shooting with manual focusing, push FOCUS down to PUSH AUTO.
The autofocusing functions **while you are pressing the button**. When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

Shooting in relatively dark places

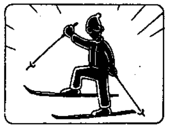
When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.

Compensating Backlighting

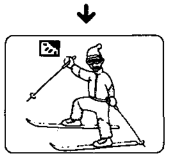
In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button to get natural exposure.



Press BACK LIGHT.
The ▨ indicator appears. If it does not appear, press the button again.



Subject is too dark because of backlight.



With backlight compensation

After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again.
(The ▨ indicator goes out.)
Otherwise, picture will be too bright under normal lighting condition.

Using Program AE

When you use the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (shallow depth of field) or capture high-speed action with "sports" mode or "high-speed shutter" mode.

What is PROGRAM AE (Auto Exposure)?

Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control of depth of field (distance range of object that will be in sharp focus). There are four preprogrammed modes: Normal (the green position), Portrait , Sports , and High-speed shutter . (See pages 40 to 42.)

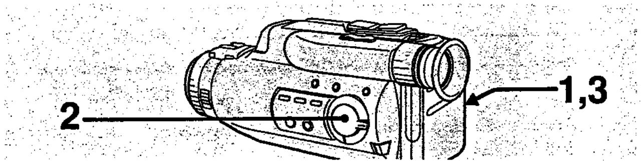
Portrait Mode

In the portrait mode, the object is in focus and the background is out of focus. Therefore, you can use this mode to highlight the subject. The aperture is controlled to open by automatically selecting the shutter speed (between 1/60 to 1/1850 that matches the shooting situation) to maintain the appropriate exposure. The portrait mode is most effective to be used outdoors.

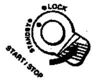
You may want to use the portrait mode when shooting the following subjects:

- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- subjects behind such obstacles as net

How to set to portrait mode

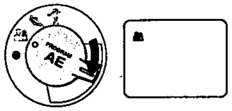


1 **Turn STANDBY up.**



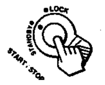
2 **Set PROGRAM AE to .**

appears in the viewfinder.



3 **Press START/STOP.**

Recording with the portrait mode starts.



To resume the automatic mode

Set PROGAM AE to the green position.

Note When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.

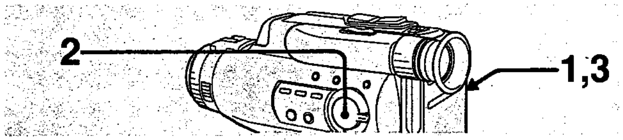
Sports Mode

In the sports mode, you can record subjects moving at high speed clearly, providing a high-quality picture minimum blur in the slow and still playback modes. The fastest shutter speed that matches the shooting situation (between 1/60 and 1/500) is selected to maintain the appropriate exposure. The sports mode provides more effective recording than you can achieve by using the high-speed shutter mode.

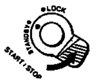
You may want to use the sports mode when shooting the following subjects:

- outdoor sports scene such as football, tennis or golf
- recording a landscape in a moving car

How to set to sports mode

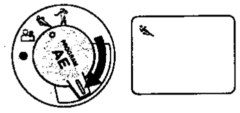


1 **Turn STANDBY up.**



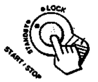
2 **Set PROGRAM AE to .**

appears in the viewfinder.



3 **Press START/STOP.**

Recording with the sports mode starts.



To resume the automatic mode

Set PROGRAM AE to the green position.

Hint for effective camera work

When shooting sports event from a distance, such as a football game, we tend to zoom from the wide to the telephoto position to catch the one-time events. Even under these circumstances, by using the sports mode, you can get a sharp picture when played back later in the slow or still mode.

Notes

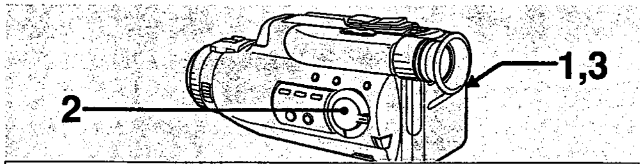
- The sports mode is effective under sufficient lighting, such as under sunlight.
  When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.

High-speed Shutter Mode

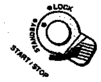
🏌 In the high-speed shutter mode. The shutter speed is set to 1/4000. Subjects moving at high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow modes compared to slower shutter speeds. Remember that you need enough lighting to use the high-speed shutter mode since the aperture is fixed.

You may want to use the high-speed shutter mode when:
- Shooting a golf swing or a tennis match with the tennis ball captured cleary.
- You wish to play back certain scenes with high speed movements in a clear, sharp picture.

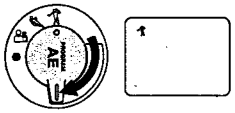
How to set to high-speed shutter mode



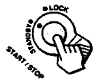
1 **Turn STANDBY up.**



2 **Set PROGRAM AE to 🏌.**
🏌 appears in the viewfinder.



3 **Press START/STOP.**
Recording with the high speed shutter mode starts.



To resume the normal shutter speed

Set PROGRAM AE to the green position

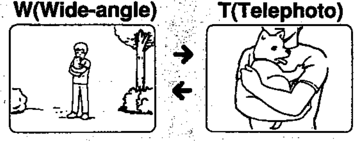
Notes
- In the high-speed shutter mode, record under sunlight or use a video light.
- When you record a TV screen in the high-speed shutter mode, the brightness of the recorded picture may vary.
- When you shoot a very bright subject in the high-speed shutter mode, a light vertical, belt-like line ("smear") may appear on the screen.
- When you record in the high-speed shutter mode under a light discharged tube, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary.

Using the Special Effects

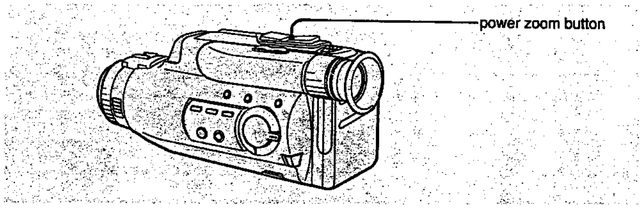
You can get a professional-looking home video using these sepcial effects; zoom, close-up, fade-in and fade-out.

Zooming

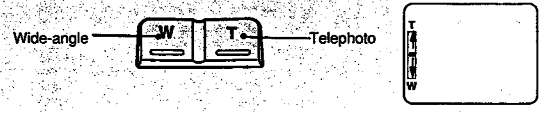
You can change the size of the subject in the scene. Use zooming to focus manually or to decide the shooting angle. Also use "zoom-in (Telephoto)" for dramatic close-ups. Use "zoom-out (Wide-angle)" for panoramic long shots.
Most common mistake, however, is using zoom-in or zoom-out too often during recording. For natural recording, you may want to set the zoom first and then start recording.



To zoom



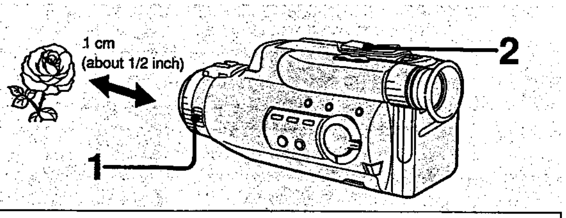
Press the T side of power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).



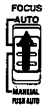
The camcorder's power zoom button offers a variable speed zooming; pressing it firmly for high speed zooming and softly for normal speed zooming.
Variable speed zoom cannot be operated with the power zoom button on the Commander.

Close-up (Macro)

You can shoot subjects that are at least 1 cm (about 1/2 inch) away from the lens surface.

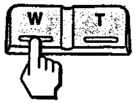

1 cm
(about 1/2 inch)
1
2

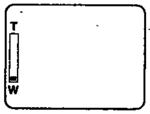
1 **Set FOCUS to AUTO.**


FOCUS
AUTO
MANUAL
PUSH AUTO

2 **Press the W side of the power zoom button until the indicator inside the viewfinder stops at the W end.**

(MACRO)





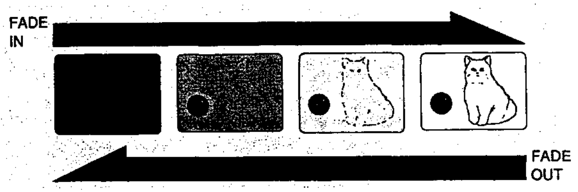
Manual adjustment

You can shoot with manual focus in doing close up. For details, see page 38.

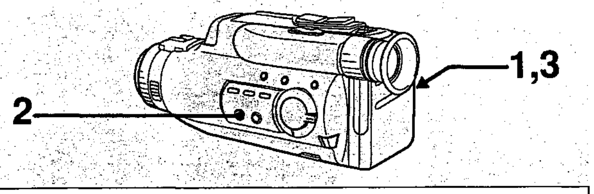
Note When doing close up, the depth of field (distance range of the subject that will be in sharp focus) is very shallow. So pay attention to focusing. To keep the subject in focus,use a tripod.

Fade-in and Fade-out

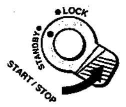
You can fade-in or fade-out to give your recording a professional appearance.
When fading-in, the picture will gradually appear from black.
The sound will also be gradually increased.
When fading-out, the picture will gradually fade to black. The sound will be decreased.


FADE IN
FADE OUT

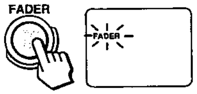
To fade-in



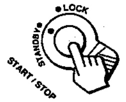
1 **Turn STANDBY up.**


LOCK
STANDBY
START/STOP

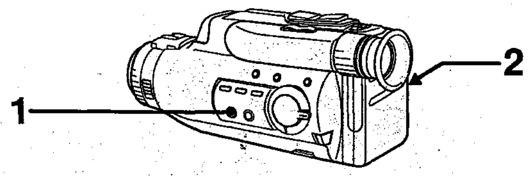
2 **Press FADER.**
The "FADER" indicator appears in the viewfinder and blinks.


FADER
FADER

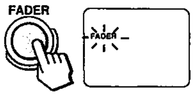
3 **Press START/STOP.**
Fade-in is performed and recording will start.


LOCK
STANDBY
START/STOP

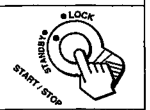
To fade-out



1 **While recording, press FADER.**
The "FADER" indicator appears in the viewfinder and blinks.



2 **Press START/STOP to stop recording.**
Fade-out is performed and then recording stops.



To cancel the fade-in/out function
Before pressing START/STOP, press FADER again.

If you want to use the fade-in/out function repeatedly
Start from step 1 each time.

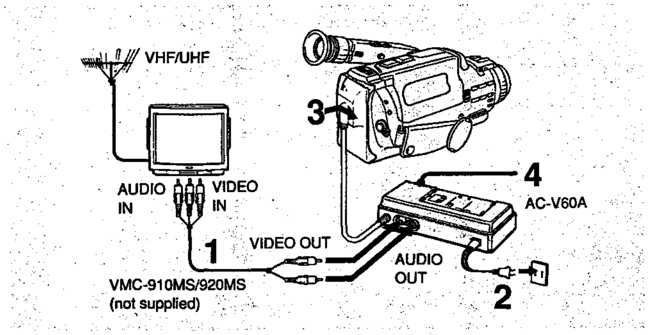
When the date/time (page 29), or age (page 30) is displayed
The date/time, or age does not fade-in or fade-out.

Playing Back

In the earlier section (page 20), we've explained the basic connection to your TV.
Here, we will talk about several other ways of connection to TV depending on the type of TV you have.
You can easily make a proper connection of camcorder and TV by using the supplied AC-V60A AC power adaptor.
If you connect a TV not equipped with video/audio inputs, see page 20.

Connecting a TV with Video/Audio Inputs

How to connect a TV with video/audio inputs
Use the supplied AC-V60A AC power adaptor and A/V connecting cable to connect to the TV. Make sure that the TV is turned off to prevent damage to the speaker.



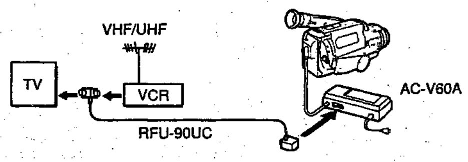
1 Connect Video and Audio using the A/V cable between TV and AC power adaptor. If your TV is a monaural type, use the VMC-710M/720M A/V connecting cable (not supplied).
2 Connect the AC power adaptor to a wall outlet.
3 Attach the connecting plate of the AC power adaptor to the camcorder.
4 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

Note
Perform only steps 3 and 4 when playing back a tape. You can keep the AC power adaptor and the TV connected when playing back a tape.

Connecting to a TV via a VCR

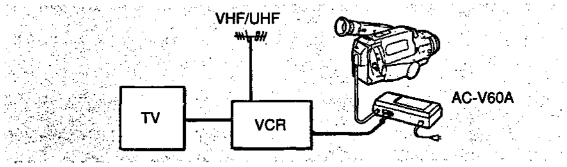
If your TV has no VIDEO/AUDIO input jacks

Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor to the VHF/UHF input of the TV and VHF/UHF output of the VCR.



If your TV has VIDEO/AUDIO input jacks

Connect Video and Audio from the AC power adaptor to the VCR instead of to the TV. Set the input selector of the VCR to LINE, if available.

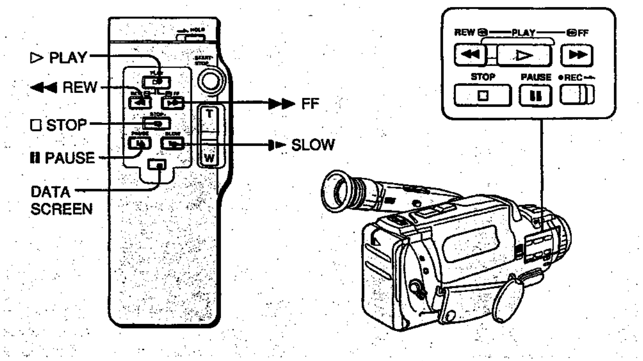


Playing Back a Tape in Various Speeds

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the ■ REMOTE COMMANDER ON/OFF switch to ON.

To make the same indications in the viewfinder on the TV (only on the Commander)

Press DATA SCREEN.
To turn the indications off, press it again.
This DATA SCREEN on TV will tell you which playback mode you are using.



To view the still picture (playback pause)

Press II during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or II.

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To view the picture at 1/5 speed (slow playback) (only on the Commander)

Press I▶ during playback.
I▶ appears in the viewfinder.

Note
To resume normal playback, press ▷.
When slow playback lasts for 1 minute or more, the playback at the normal speed starts automatically.

To locate the desired scene (picture search)

Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)

Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, press ▷.

About the playback picture

During the various playback modes, streaks appear on the screen.

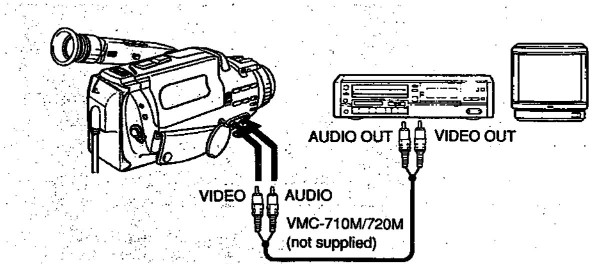
Recording

Recording from a VCR or TV

You can record a tape from another VCR or a TV program from the TV both equipped with video/audio outputs.

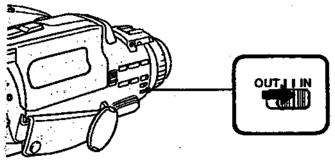
How to connect

Disconnect the RFU adaptor from the AC power adaptor if it is connected.
Make connection using the appropriate A/V cable (such as Sony VMC-710M/720M for monaural equipment or VMC-910MS/920MS for stereo equipment).



How to record

1 **Set the IN/OUT selector on the camcorder to IN.**



2 **Turn on the VCR or TV.**

3 **Play back the tape or select the TV channel to be recorded.**

4 **Set POWER of the camcorder to VTR.**

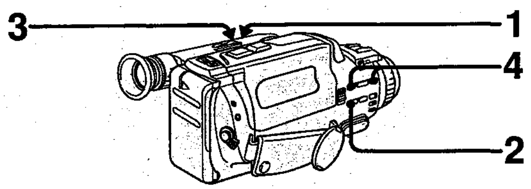
5 **Insert a tape and slide ● REC.**
Recording starts. You can monitor the picture being recorded in the viewfinder.

Using the Tape Counter

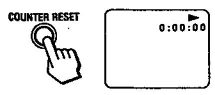
During recording or playback, the digits on the counter indicate the actual recording or playback time.

To count the whole tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

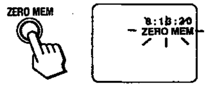


1 **During playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".

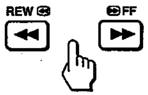

COUNTER RESET
0:00:00

2 **Press □ when the playback has finished, as usual.**

3 **Press ZERO MEM.**
The "ZERO MEM" indicator blinks in the viewfinder.
Be sure to press ZERO MEM after you stop the tape. It does not function during recording or playback.


ZERO MEM
ZERO MEM

4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.



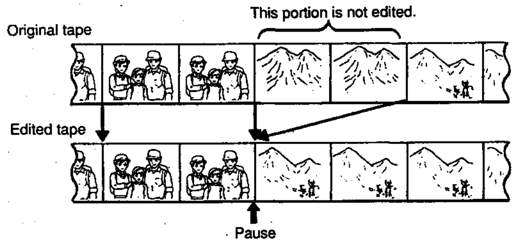
Notes on the tape counter and the ZERO MEM button

- Something must be recorded on the tape in order for the tape counter to function. Tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
  There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Editing

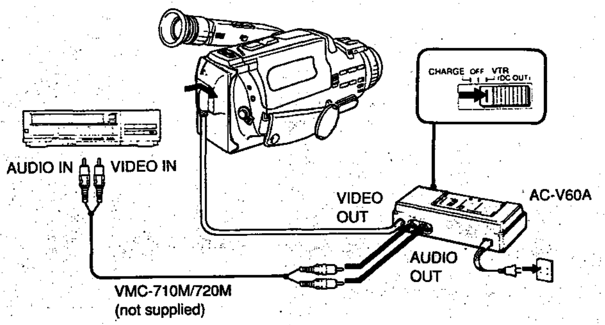
Editing Tapes with a VCR

You can edit a tape with an additional 8 8mm, β Betamax or VHS VHS format VCR.


This portion is not edited.
Original tape
Edited tape
Pause

How to connect

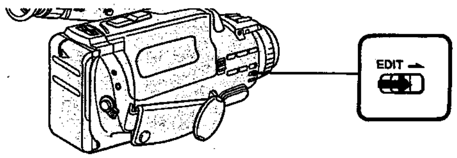
Make connections using the appropriate A/V cable (such as Sony VMC-710M/720M for monaural VCR or VMC-910MS/920MS for stereo VCR) and set the CHARGE/VTR selector on the AC power adaptor to VTR. Set the input selector of the VCR to LINE, if available.


CHARGE OFF VTR
DC OUT
AUDIO IN
VIDEO IN
VIDEO OUT
AC-V60A
AUDIO OUT
VMC-710M/720M
(not supplied)

How to edit

1 **Insert a tape to be recorded into recording VCR.**

2 **Slide EDIT on the camcorder to the direction of the arrow.**



3 **Set POWER of the camcorder to VTR, then insert the recorded tape.**

4 **Play back a tape on the camcorder until you locate the point where you want to start editing, then set the camcorder to the playback pause mode.**

5 **On the recording VCR, locate the recording starting point and set the VCR to the recording pause mode.**

6 **Press II PAUSE of the camcorder and VCR simultaneously to start editing.**

To edit more scenes

Repeat steps 4 to 6.

To stop editing momentarily

Press **II** on the recording VCR.

To stop editing

Press □ on both VCRs.

If you use the DATA SCREEN function

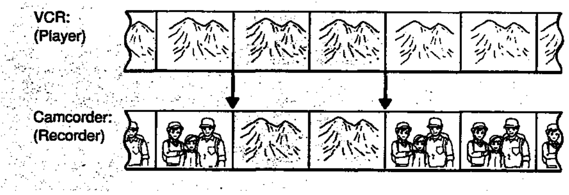
The indicators displayed on the TV screen will also be recorded.

Use of the EDIT switch

When you set EDIT to the direction of the arrow (EDIT ON), you can keep picture and sound deteriorations resulting from editing to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Replacing Recordings on a Tape (Insert Editing)

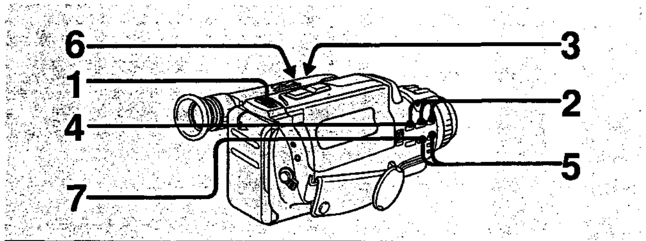
You can insert a new scene from a VCR on your originally recorded tape by setting the starting point and ending point.



How to connect

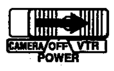
Connections are the same as in "Recording from a VCR or TV (page 51)." Before you begin replacing recordings, **set the VCR to the playback pause mode at the beginning of the scene to be recorded.** Set the CHARGE/VTR selector on the AC power adaptor to VTR.

How to replace recordings

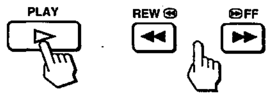


1 **Press the small green button on POWER and slide POWER to VTR.**

The counter appears in the viewfinder.

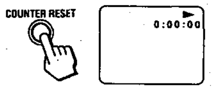


2 **Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.**



3 **At the end point, press COUNTER RESET.**

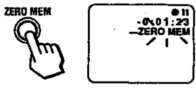
The counter is reset to "0:00:00".



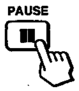
4 **Locate the start point where the insert should begin by pressing ◀◀.**

5 **At the start point, set the camcorder into recording pause mode.**

6 **Press ZERO MEM.**
The end point of the insert is stored in memory.



7 **Press II of both units to start insert editing.**
You can monitor the picture being inserted in the viewfinder screen.



The insert recording will stop automatically near the zero point on the counter.

To change the end point

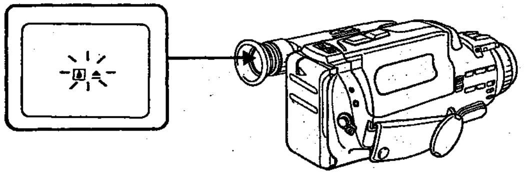
Press ZERO MEM so that the ZERO MEM indicator disappears, and operate again from step 2.

Maintenance Information

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors.
However, take the following precautions.

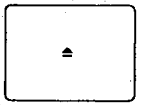
If moisture condenses inside the unit



Moisture is present inside the camcorder when:
- The ▣ indicator in the viewfinder blinks.
  When the tape is inserted, the ≜ indicator also blinks.
- Several beeps sound continuously for five seconds when the BEEP switch is set to ON and the tape is inserted.

In such cases, no function except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape



Moisture is present on the surface of the tape when:
- The ≜ indicator blinks inside the viewfinder when the tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed.
- Several beeps sound continuously for about five seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.
Eject the tape and let the camcorder and the tape sit for at least 1 hour.
The tape can be used again if the ≜ indicator does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indicators will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

Video Head Cleaning

Slight contamination
Critical contamination

To ensure clear picture, clean the video heads periodically

When playback pictures become noisy or hardly visible, the video heads may be contaminated.
In such case,

1. Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2. After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3. If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

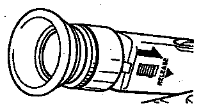
Caution Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

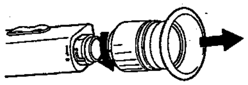
Viewfinder Cleaning

To clean the viewfinder

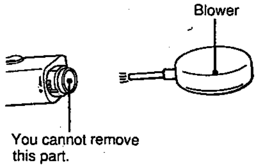
1 Pull the switch on the viewfinder barrel down.



2 Turn the eyecup in the direction of the arrow and detach the eyecup.



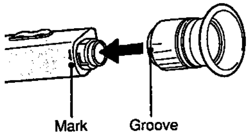
3 Clean the surface of the screen with a commercially available blower.



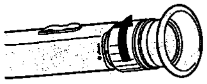
To reattach the eyecup

1 Pull the switch on the viewfinder barrel down.

2 Align the groove on the eyecup with the ● mark on the barrel.



3 Turn the eyecup in the reverse direction of the arrow.



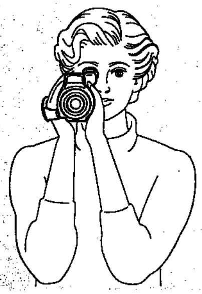
Tips for Better Camera Recording

How to Achieve Better Camera Recording

Take a good posture for shooting

For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite to the subject and let your feet take a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.

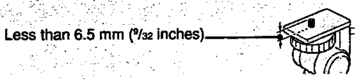


Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

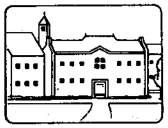
Caution

When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm. Otherwise the screw may damage the inner part of the camera.



Keep the horizontal plane level

You can easily determine the horizontal plane by using the viewfinder frame as a reference.



Tips for Better Camera Recording

Plan ahead

If you are going to edit the tape after recording, shoot the scene a little longer to make the editing easier.

Lighting

Shoot with the sun behind you.
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video light in the dark

To get the best colors, you must maintain a sufficient light level.
Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe and direct connection to the camcorder.
Do not point the light at the camcorder. The high heat from the light may warp the casing of the camcorder.
For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Situation	Brightness	Condition
Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter recommended
Clear day, mid day (100,000 lux) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	100,000	Normal recording
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000)	10,000	
Clear day, one hour before sunset (1,000) Department store counter (500 – 700) Station wicket (650) Office lit by fluorescent lamps (400 – 500)	1,000	
Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)	500 300	
Arcade at night (150 – 200)	100	
Theater lobby (15 – 35) Candlelight (10 – 15)	10	Video light recommended

Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Difference In Color System

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be an NTSC system based TV. Check the following list (in alphabetical order).

NTSC system countries

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country

Brazil

PAL N system countries

Argentina, Paraguay, Uruguay

SECAM system countries

Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.**
  When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the camcorder to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet.**
  Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

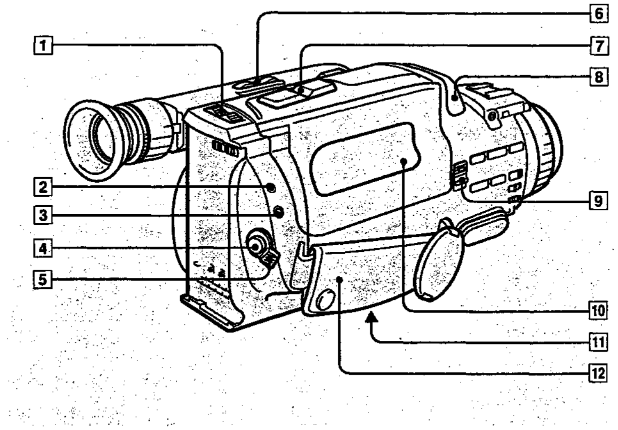
- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth. Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Identifying the Parts

For details on the use of each part, refer to the pages indicated in the circle.



1. **POWER switch**
   CAMERA: for camera recording
   VTR: for playing back or editing tapes
   OFF: power off

2. **REMOTE control connector (stereo mini-minijack) ㊱**

3. **(earphone) jack (minijack)**

4. **START/STOP button**

5. **STANDBY switch**

6. **EDITSEARCH (and ⊜ recording review) button ㉜ ㉝ ㉞ ㉟**

7. **Power zoom (MACRO) button ㊸ ㊹**

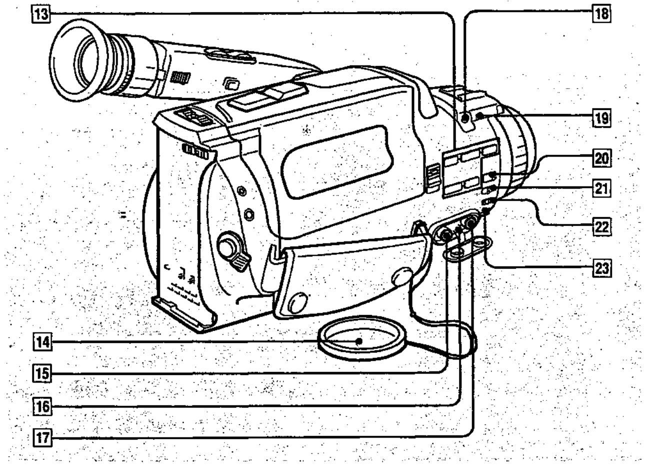
8. **Built-in microphone**

9. **EJECT (cassette eject) knob ⑨**

10. **Cassette holder**

11. **Lithium battery holder**

12. **Grip belt ⑰**



13 **Tape transport buttons ㊾**
▷ PLAY (playback)
▶▶ FF (fast-forward)
◀◀ REW (rewind)
☐ STOP (stop)
❚❚ PAUSE (pause)

14 **Lens cap**

15 **VIDEO input/output jack (phono jack) (51)**

16 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**

17 **AUDIO input/output jack (phono jack) (51)**

18 **MIC jack (PLUG IN POWER) (mono mini-jack)**

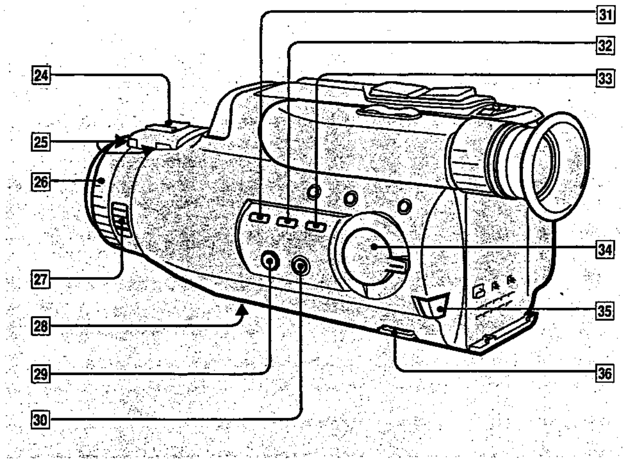
19 **Remote control senser ㉒**

20 **● REC (recording) switch (56)**

21 **EDIT switch (54)**

22 **IN/OUT (video and audio input/output) selector (51)**

23 **Hook for shoulder strap**



24 **Accessary shoe**

25 **Remote control sensor ㉒**

26 **Focus ring**

27 **FOCUS (AUTO/MANUAL/ PUSH AUTO) switch ⑰ ㊳**

28 **Tripod receptacle (bottom)**

29 **FADER button ㊺ ㊻**

30 **BACK LIGHT button ㊴**

31 **DATE (+) button ⑭ ⑮ ㉙**

32 **TIME (NEXT) button ⑭ ⑮ ㉙**

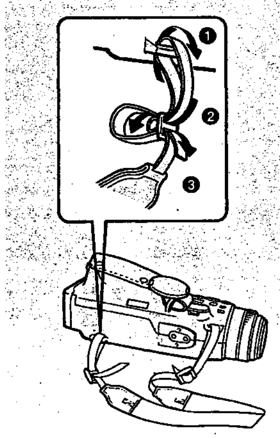
33 **AGE/EVENT button ⑮ ㉚**

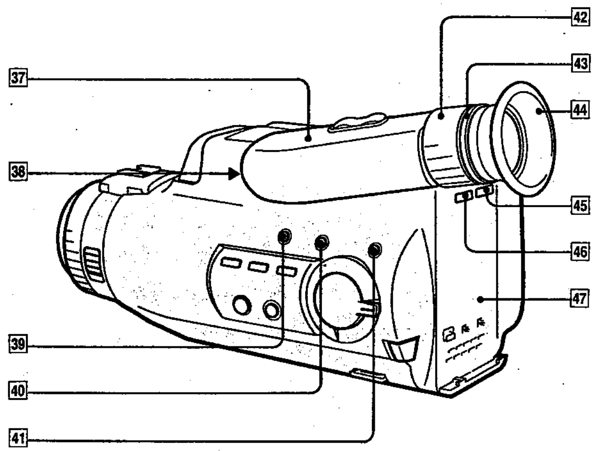
34 **PROGRAM AE selector ⑰ ㊵ ㊶ ㊷**

35 **BATT (battery eject) knob ⑦**

36 **Hook for shoulder strap**

Attaching the shoulder strap




37
38
39
40
41
42
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44
45
46
47

37 **Viewfinder**

38 **Camera recording/battery lamp ⑦②**

39 **COUNTER RESET button ㉞ (52) (55)**

40 **ZERO MEM button ㉞ (52) (56)**

41 **TAPE/BATT CHECK button ⑧ ⑲**

42 **Viewfinder adjustment ring ⑩**

43 **Stopper ring ⑪**

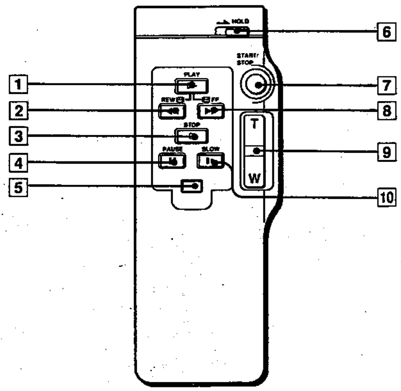
44 **Eye cap**

45 **BEEP ON/OFF switch ⑫**

46 **▣ REMOTE COMMANDER ON/OFF switch ㉒**

47 **Battery mounting surface**

Wireless Remote Commander


HOLD
START/STOP
PLAY
REW
FF
STOP
PAUSE
SLOW
T
W
1
2
3
4
5
6
7
8
9
10

1 **▷ PLAY (play back) button ㊾**

2 **◀◀ REW (rewind) button ㊿**

3 **□ STOP button**

4 **II PAUSE button ㊾**

5 **DATA SCREEN button* ㊾**

6 **HOLD switch* ㉓**

7 **START/STOP button**

8 **FF ▶▶ (fast forward) button ㊿**

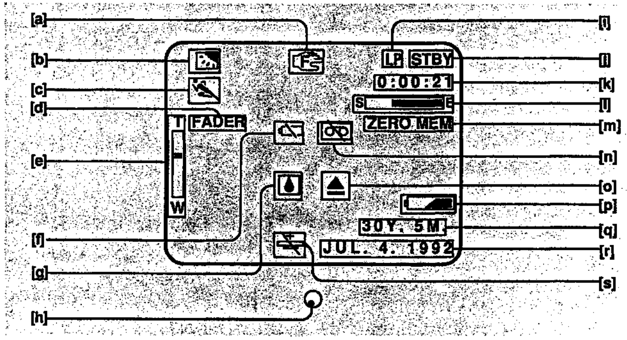
9 **Power zoom button**

10 **I▶ SLOW (slow playback) button* ㊾**

Note
The * indicates the functions which are operable only with the commander.

Indicators inside the Viewfinder

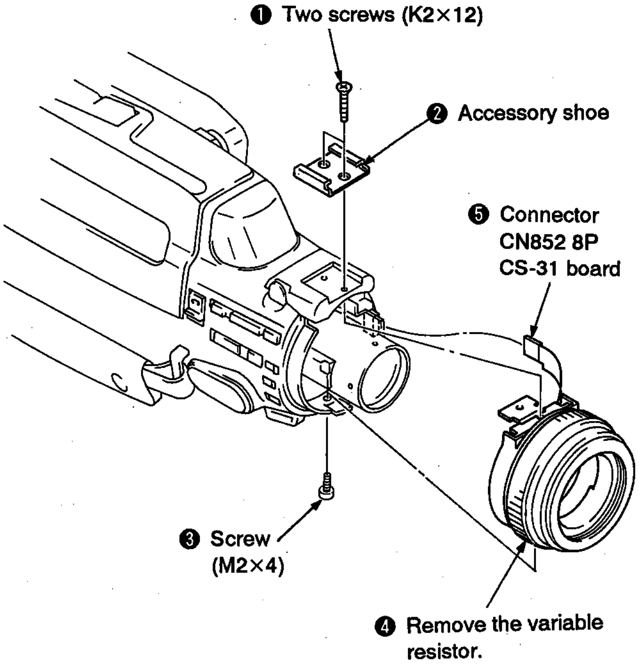
Inside the Viewfinder


[a]
[b]
[c]
[d]
[e]
[f]
[g]
[h]
[i]
[j]
[k]
[l]
[m]
[n]
[o]
[p]
[q]
[r]
[s]
T
FADER
W
LP
STBY
0:00:21
S
E
ZERO MEM
30Y. 5M
JUL. 4. 1992

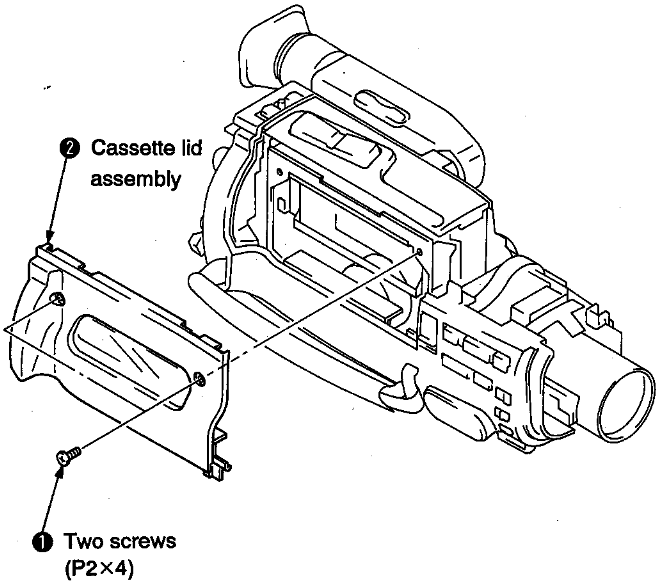
[a] Manual focusing (F)
[b] BACK LIGHT is pressed. (☒)
[c] PROGRAM AE setting (, ,)
[d] FADER is pressed.
[e] Power zoom indicator
[f] "Exchange battery." (▭)
[g] Moisture has condensed. (◙)
[h] Lights up during recording.
When blinking:"Exchange battery or tape."
[i] Playback mode (LP)
[j] Tape transport mode
[k] Tape counter
[l] Remaining time of tape
[m] ZERO MEM is pressed.
[n] "Exchange tape or no tape inside." (⊡)
[0] "Trouble has occurred" (⏏) "Clean video heads." (⊗)
[p] Remaining capacity of a battery
[q] Age
[r] Date or Time
[s] "Replace lithium battery" (⊕)

SECTION 2
DISASSEMBLY

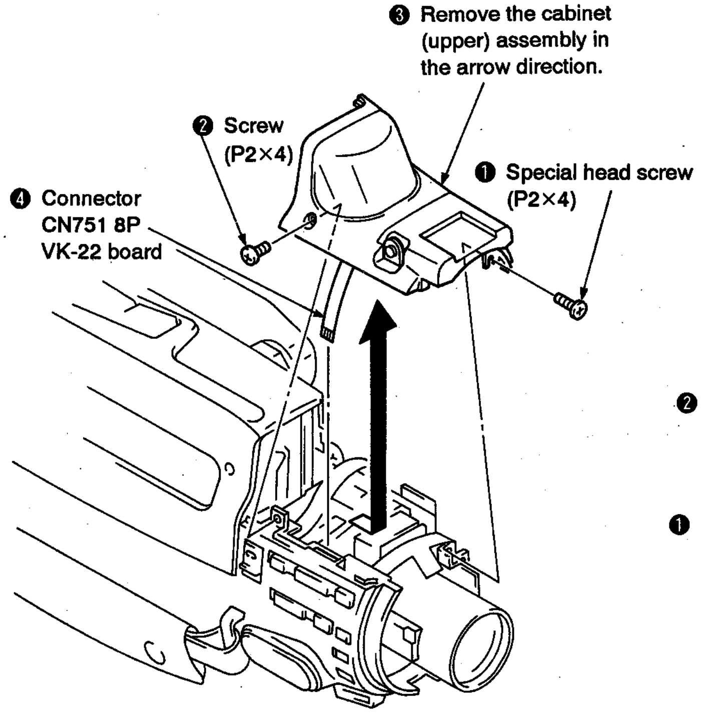
2-1. REMOVAL OF VARIABLE RESISTOR


❶ Two screws (K2×12)
❷ Accessory shoe
❺ Connector
CN852 8P
CS-31 board
❸ Screw
(M2×4)
❹ Remove the variable
resistor.

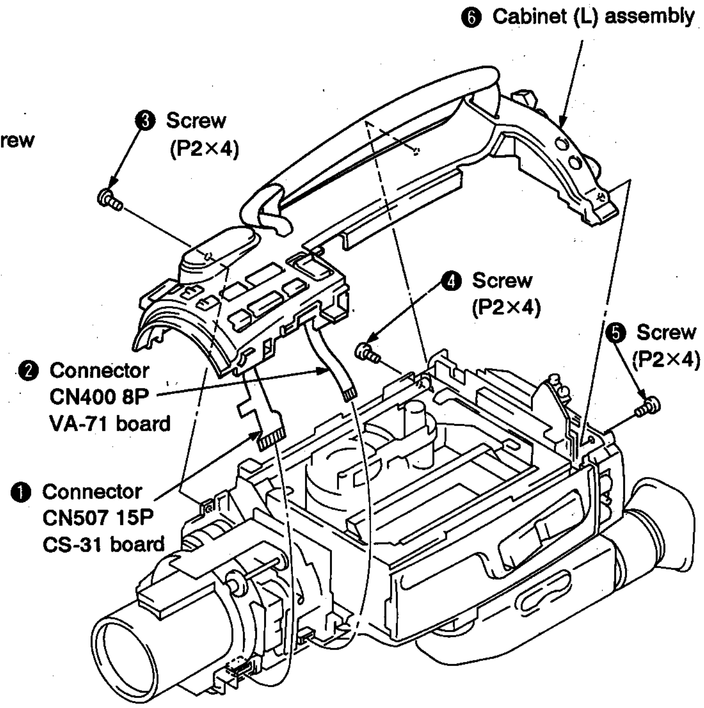
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


❷ Cassette lid
assembly
❶ Two screws
(P2×4)

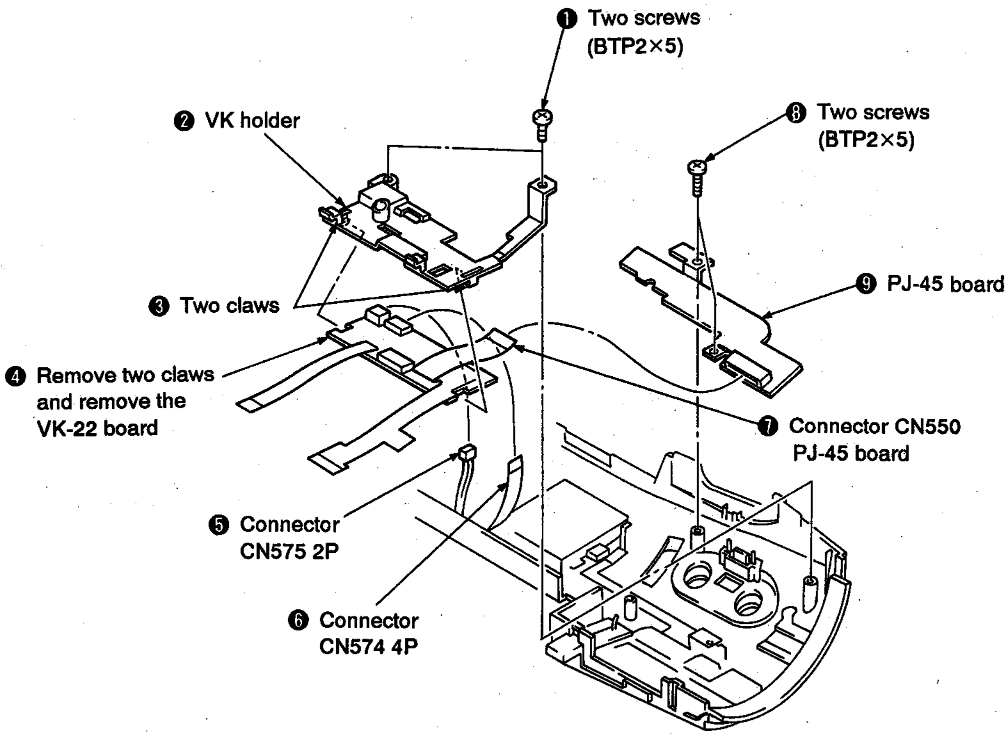
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


❸ Remove the cabinet
(upper) assembly in
the arrow direction.
❷ Screw
(P2×4)
❶ Special head screw
(P2×4)
❹ Connector
CN751 8P
VK-22 board

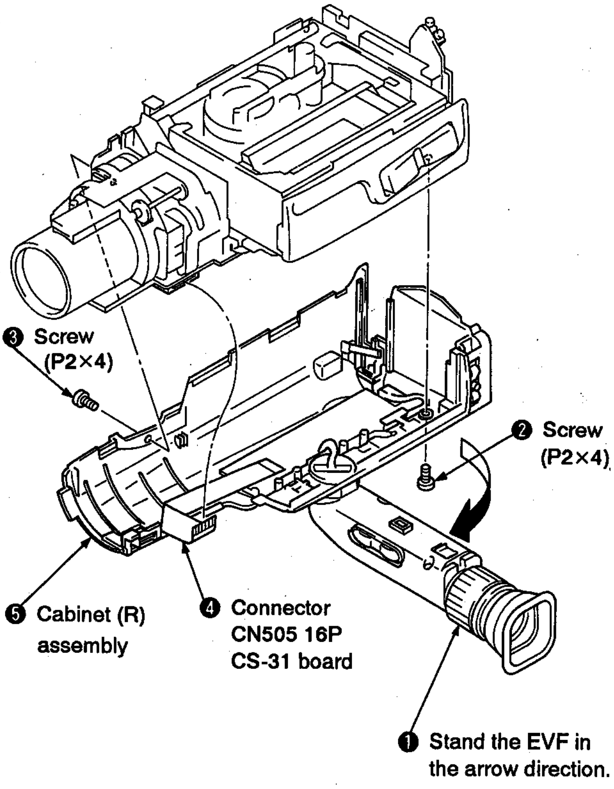
2-4. REMOVAL OF CABINET (L) ASSEMBLY


❻ Cabinet (L) assembly
❸ Screw
(P2×4)
❹ Screw
(P2×4)
❺ Screw
(P2×4)
❷ Connector
CN400 8P
VA-71 board
❶ Connector
CN507 15P
CS-31 board

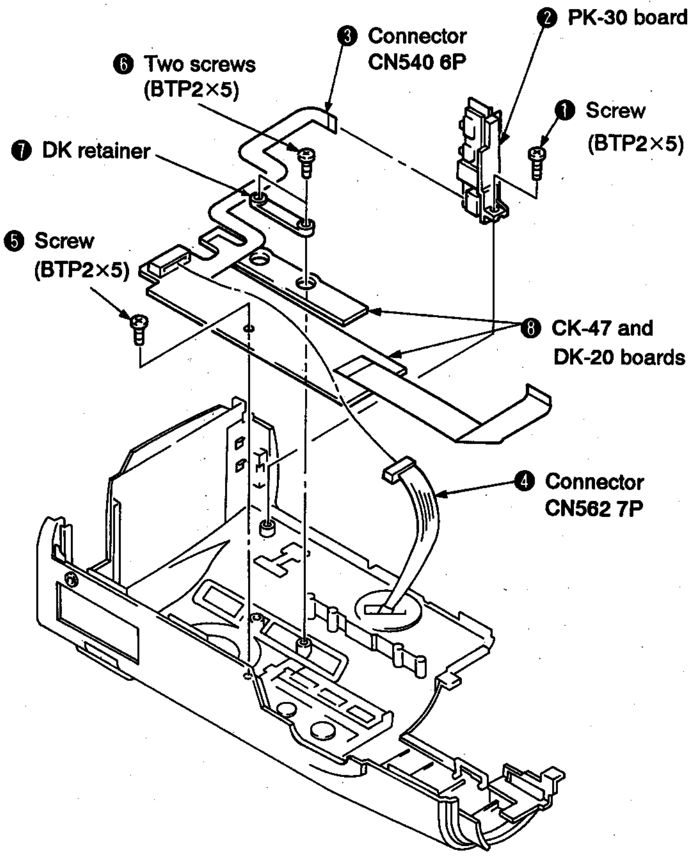
2-5. REMOVAL OF VK-22 AND PJ-45 BOARDS


❶ Two screws (BTP2×5)
❷ VK holder
❸ Two claws
❹ Remove two claws and remove the VK-22 board
❺ Connector CN575 2P
❻ Connector CN574 4P
❼ Connector CN550 PJ-45 board
❽ Two screws (BTP2×5)
❾ PJ-45 board

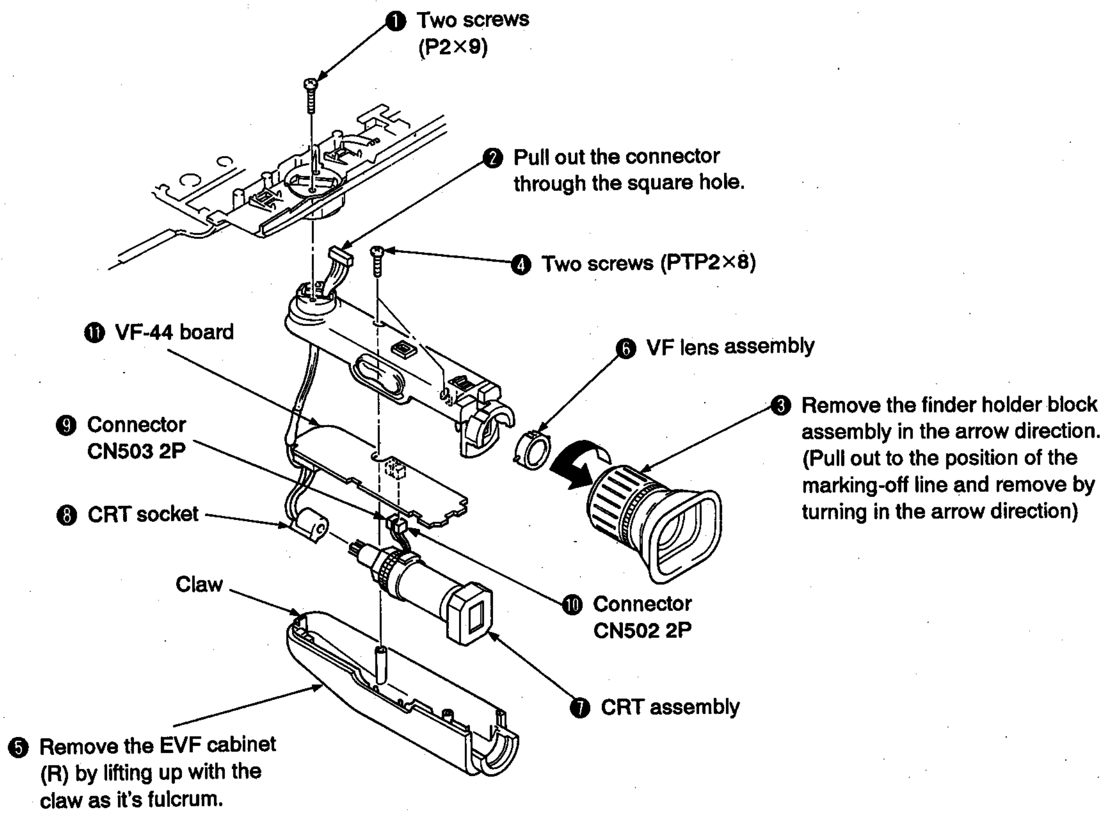
2-6. REMOVAL OF CABINET (R) ASSEMBLY


❶ Stand the EVF in the arrow direction.
❷ Screw (P2×4)
❸ Screw (P2×4)
❹ Connector CN505 16P CS-31 board
❺ Cabinet (R) assembly

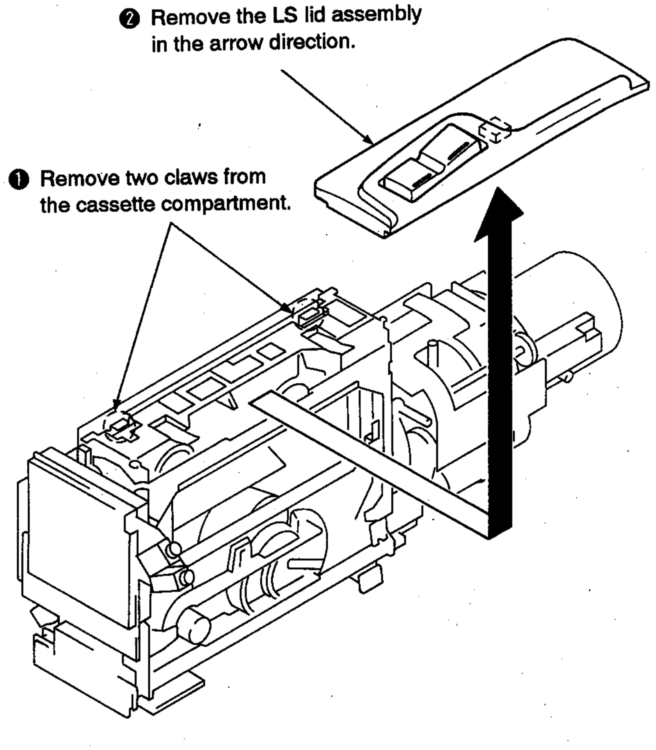
2-7. REMOVAL OF CK-47, DK-20 AND PK-30 BOARDS


❶ Screw (BTP2×5)
❷ PK-30 board
❸ Connector CN540 6P
❹ Connector CN562 7P
❺ Screw (BTP2×5)
❻ Two screws (BTP2×5)
❼ DK retainer
❽ CK-47 and DK-20 boards

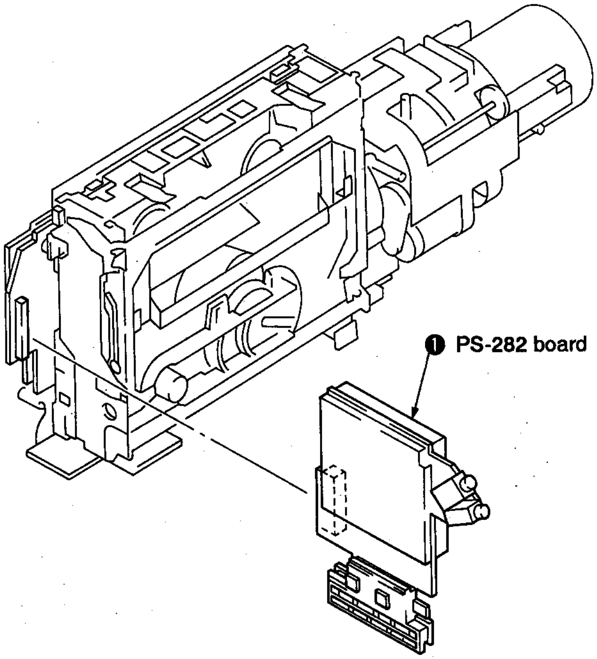
2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)


① Two screws (P2×9)
② Pull out the connector through the square hole.
④ Two screws (PTP2×8)
⑪ VF-44 board
⑥ VF lens assembly
③ Remove the finder holder block assembly in the arrow direction. (Pull out to the position of the marking-off line and remove by turning in the arrow direction)
⑨ Connector CN503 2P
⑧ CRT socket
Claw
⑩ Connector CN502 2P
⑦ CRT assembly
⑤ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

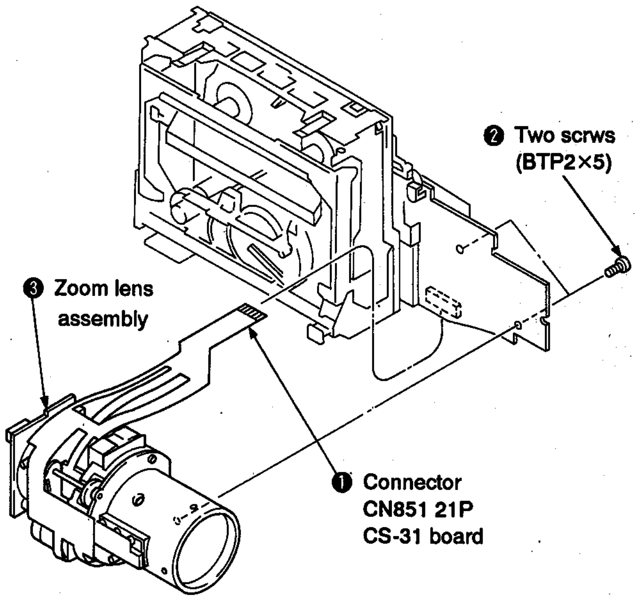
2-9. REMOVAL OF LS LID ASSEMBLY


② Remove the LS lid assembly in the arrow direction.
① Remove two claws from the cassette compartment.

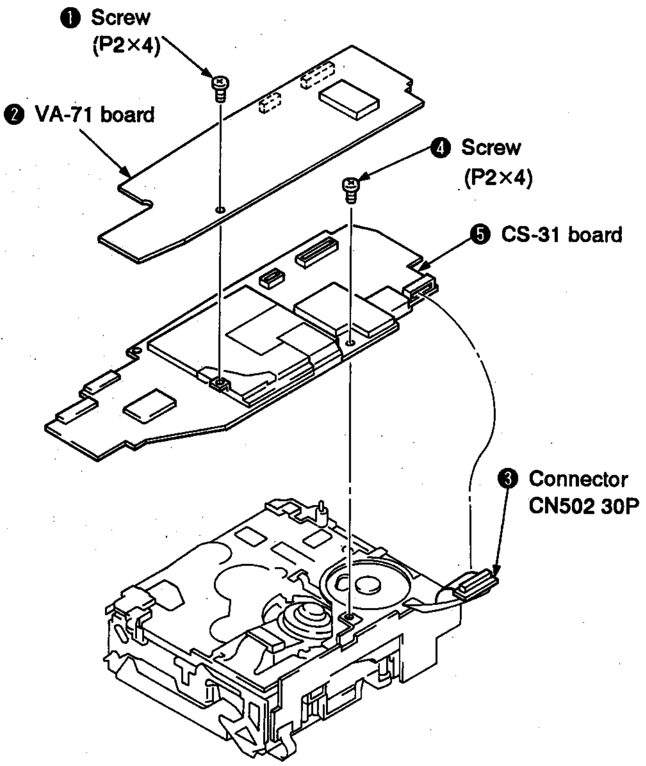
2-10. REMOVAL OF PS-282 BOARD


① PS-282 board

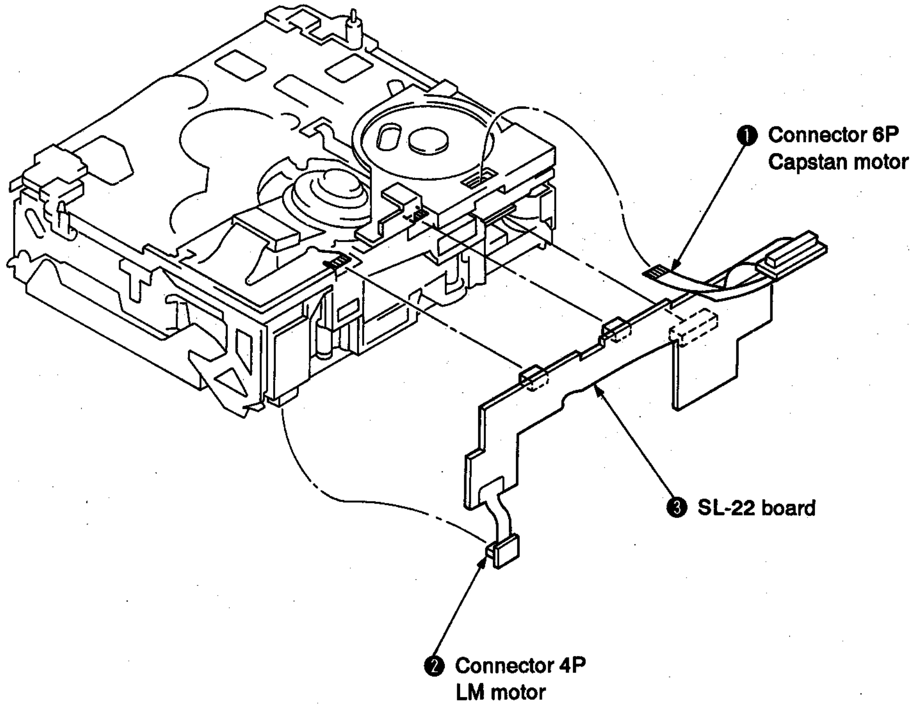
2-11. REMOVAL OF ZOOM LENS ASSEMBLY


❷ Two scrws (BTP2×5)
❸ Zoom lens assembly
❶ Connector CN851 21P CS-31 board

2-12. REMOVAL OF VA-71 AND CS-31 BOARDS

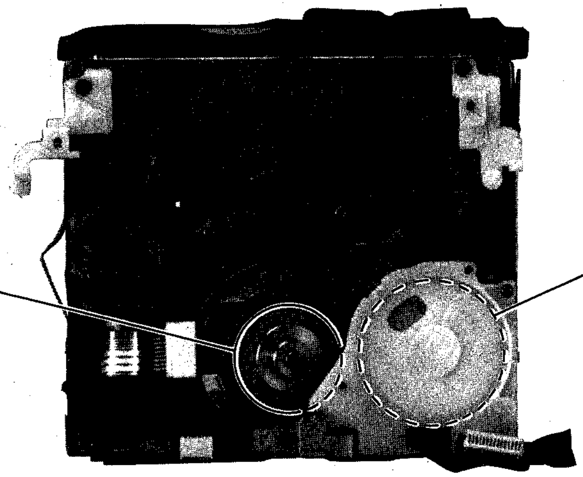

❶ Screw (P2×4)
❷ VA-71 board
❹ Screw (P2×4)
❺ CS-31 board
❸ Connector CN502 30P

2-13. REMOVAL OF SL-22 BOARD

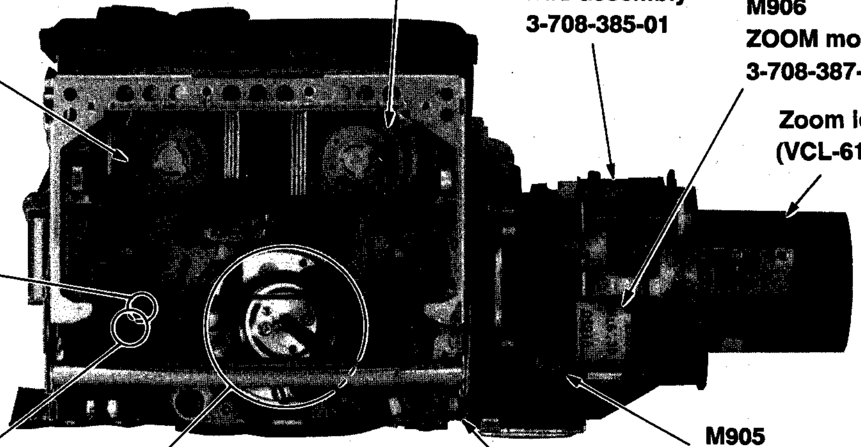

❶ Connector 6P Capstan motor
❸ SL-22 board
❷ Connector 4P LM motor

2-14. INTERNAL VIEWS

— Right side —

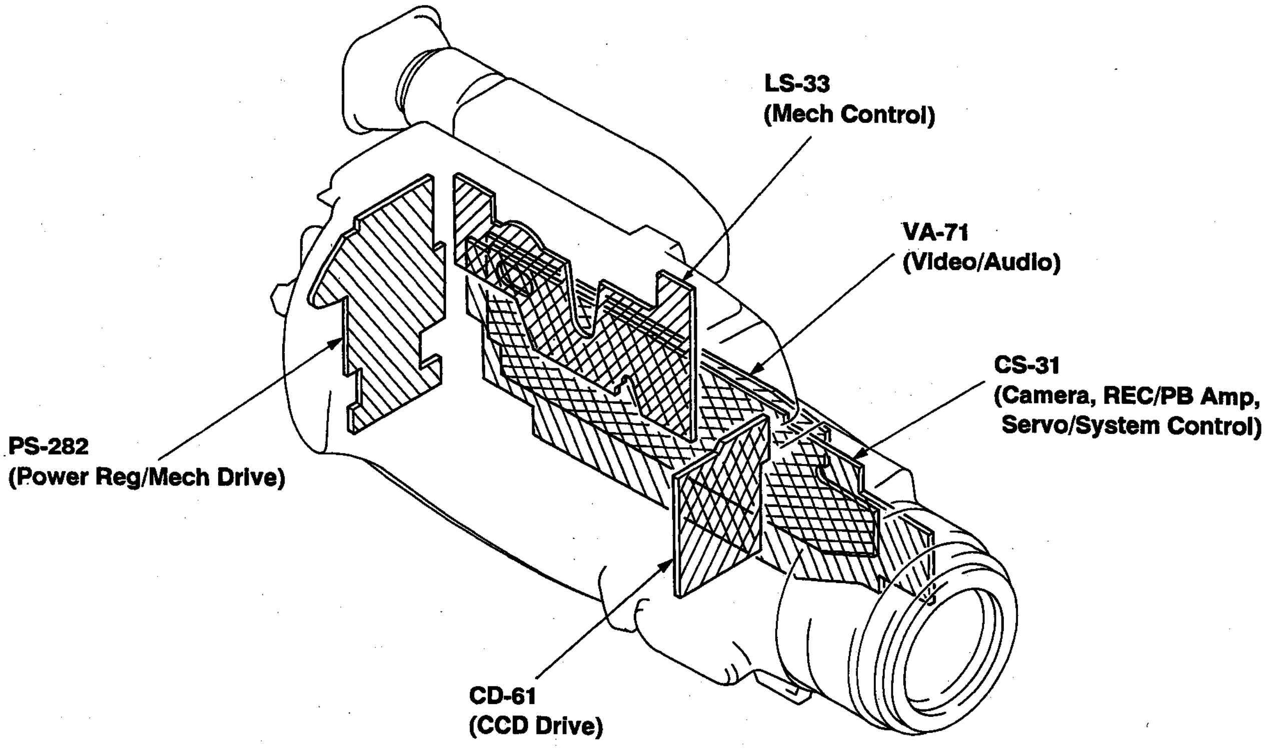

M901
Drum assembly
(DGH-78A-R)
A-7048-564-A
Upper drum assembly
(DGR-78-R)
A-7049-501-A
M902
Capstan motor
(SCE-0101A)
8-835-477-01

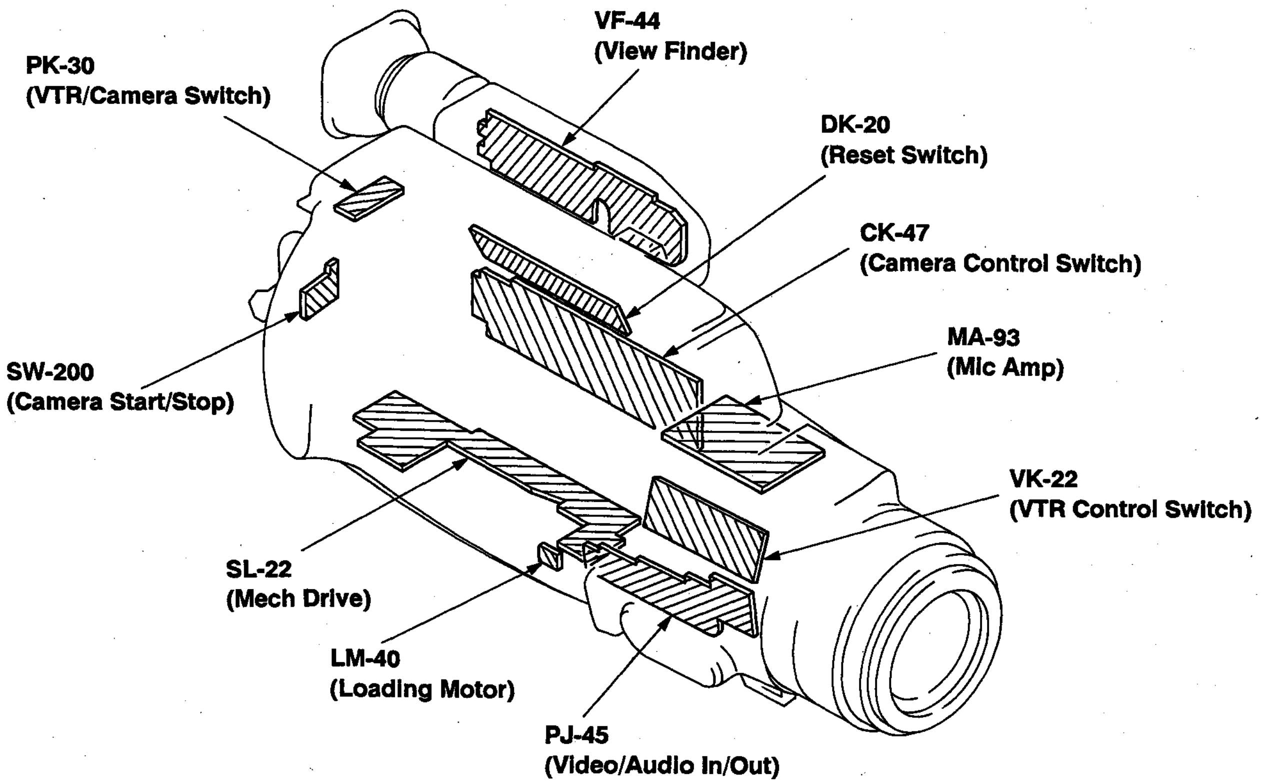
— Left side —


S reel table assembly
X-3941-275-1
T reel table assembly
X-3941-274-1
M904
IRIS assembly
3-708-385-01
M906
ZOOM motor assembly
3-708-387-01
Zoom lens assembly
(VCL-6110WA) 1-547-540-11
Pinch roller
M902
Capstan motor
(SCE-0101A)
8-835-477-01
M901
Drum assembly (DGH-78A-R)
A-7048-564-A
Upper drum assembly (DGR-78-R)
A-7049-501-A
M905
FOCUS motor assembly
3-708-389-01
M903
Loading motor assembly
A-7040-304-A

SECTION 3
DIAGRAMS

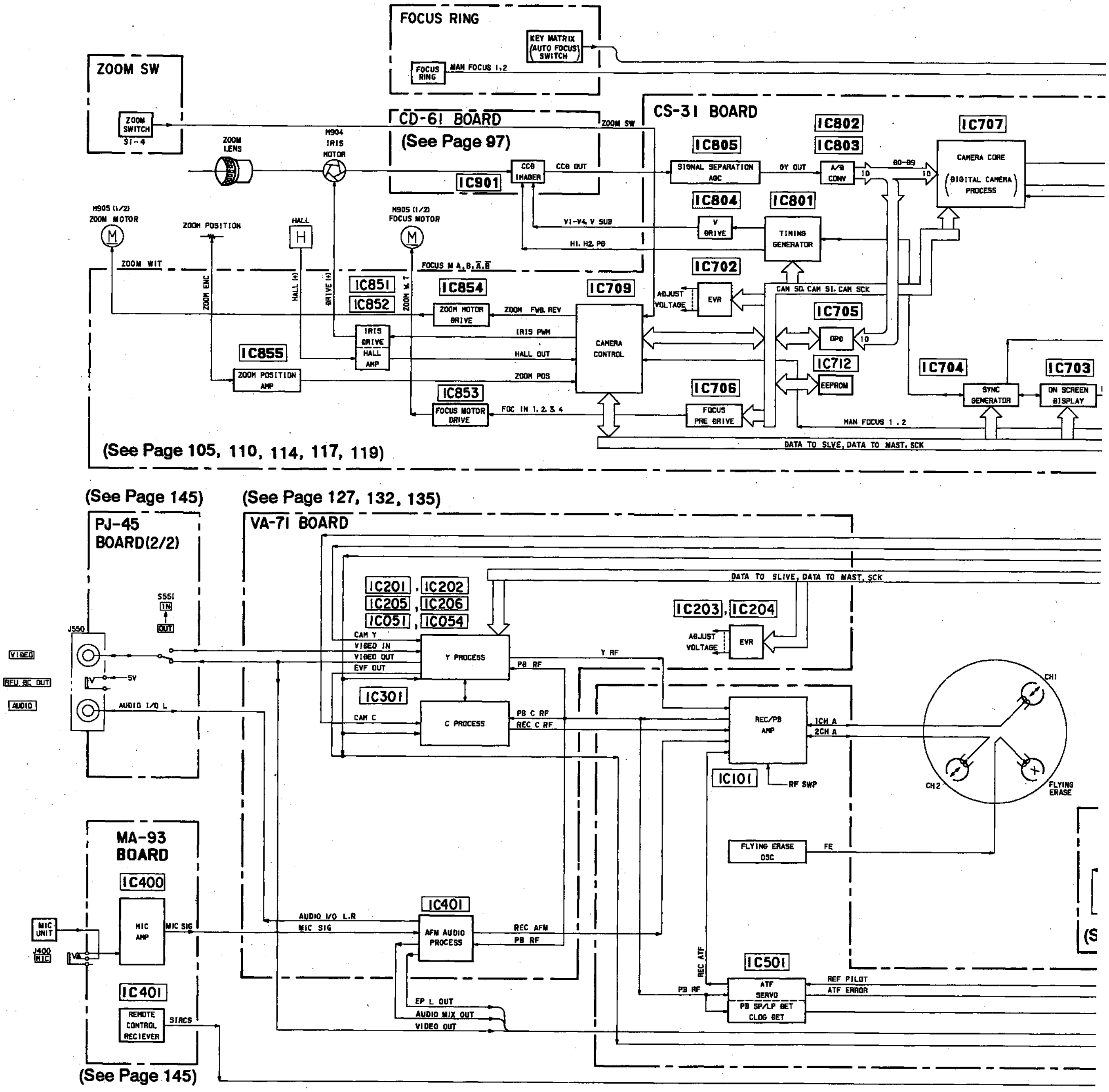
3-1. CIRCUIT BOARDS LOCATION


LS-33
(Mech Control)
VA-71
(Video/Audio)
CS-31
(Camera, REC/PB Amp, Servo/System Control)
PS-282
(Power Reg/Mech Drive)
CD-61
(CCD Drive)

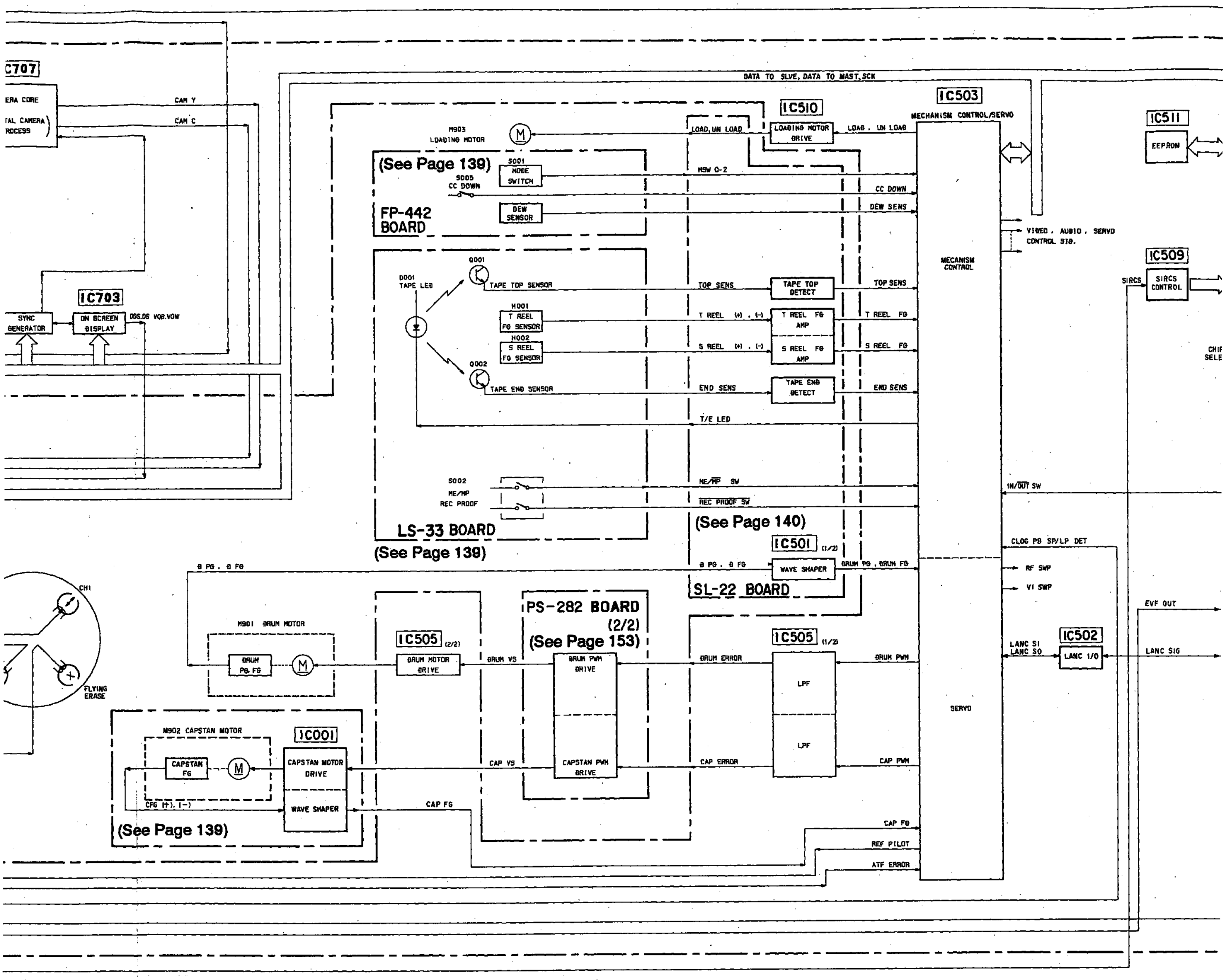

VF-44
(View Finder)
PK-30
(VTR/Camera Switch)
DK-20
(Reset Switch)
CK-47
(Camera Control Switch)
MA-93
(Mic Amp)
SW-200
(Camera Start/Stop)
VK-22
(VTR Control Switch)
SL-22
(Mech Drive)
LM-40
(Loading Motor)
PJ-45
(Video/Audio In/Out)

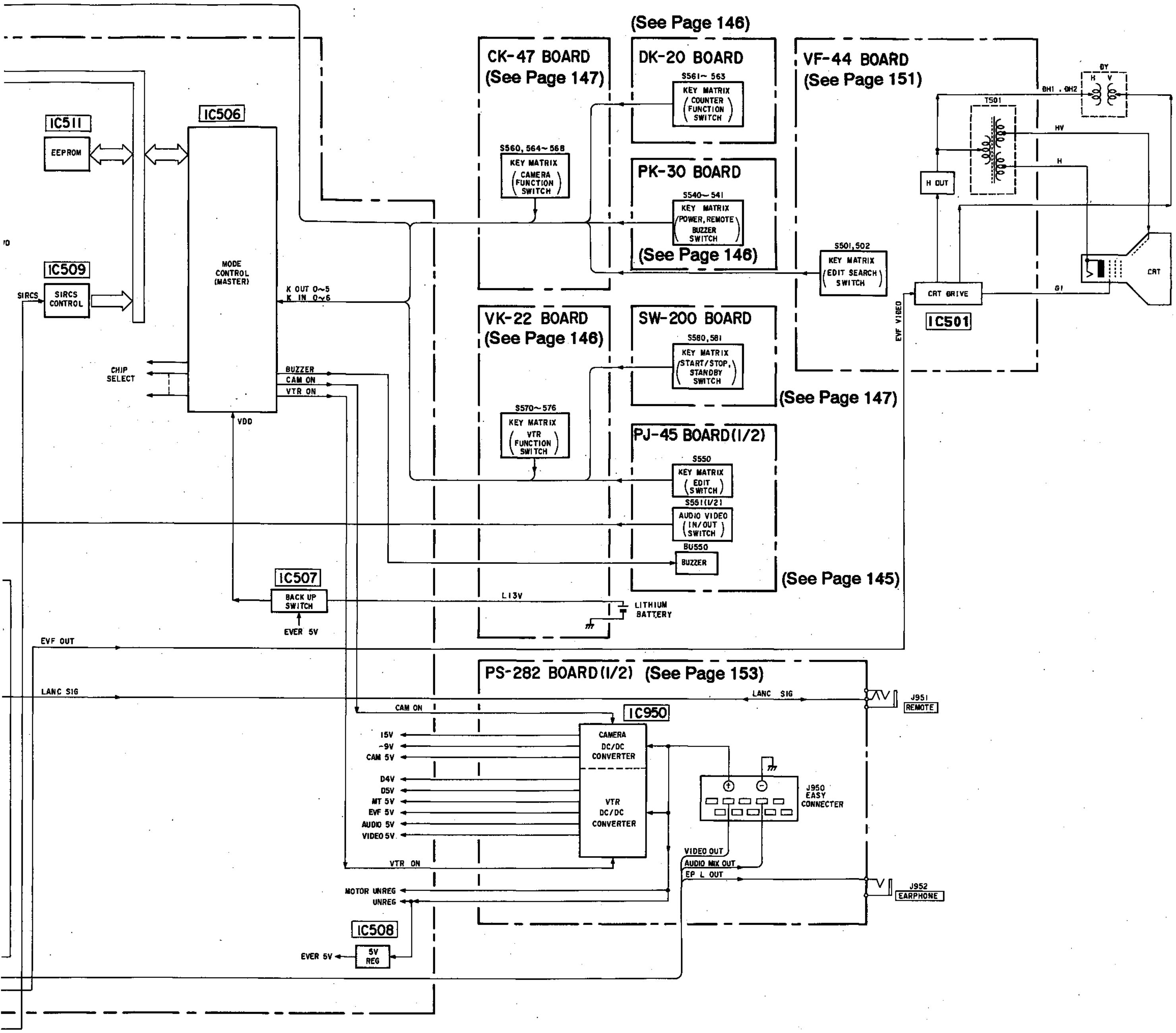
3-2. OVE

3-2. OVERALL BLOCK DIAGRAM

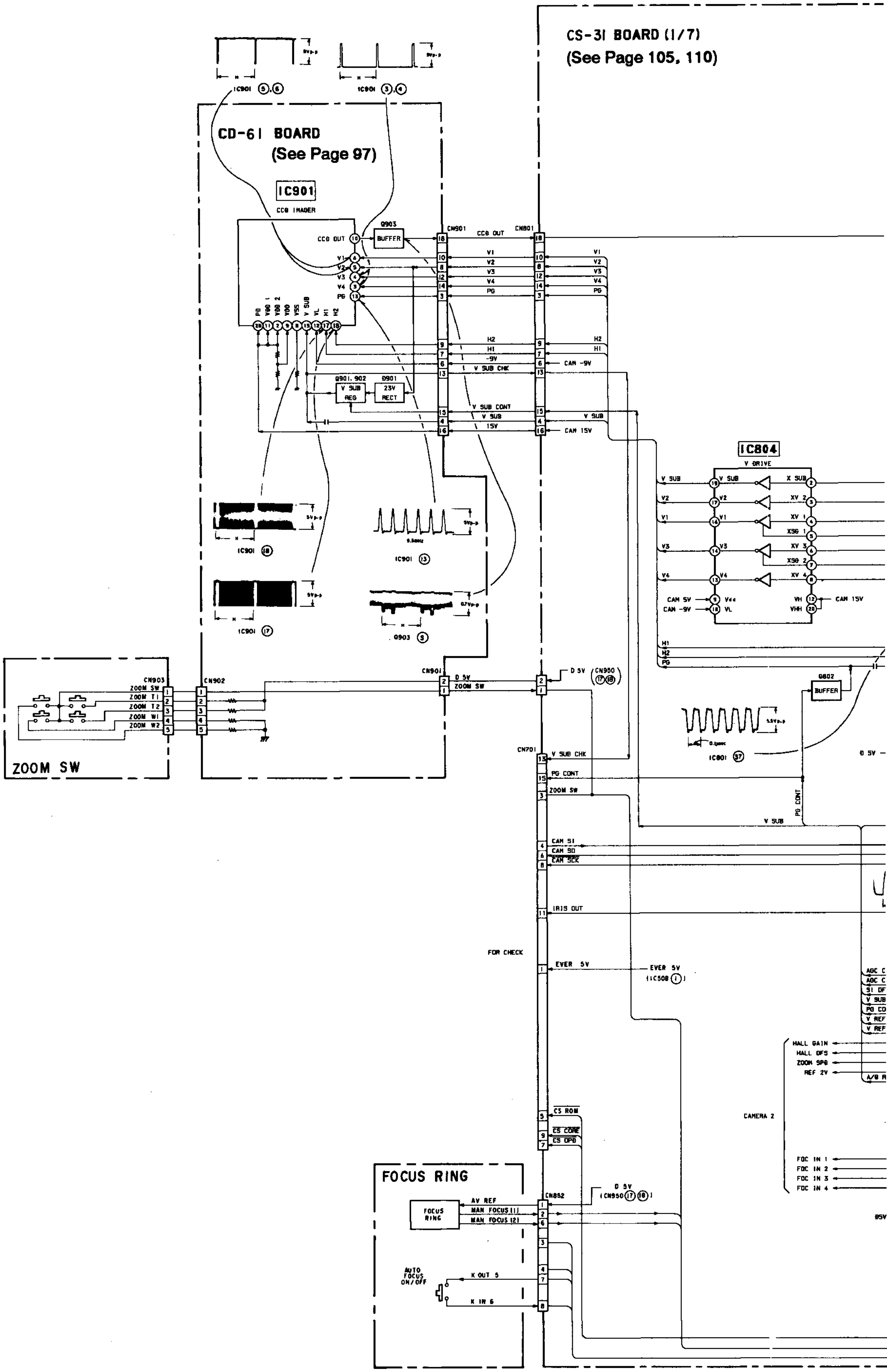


FOCUS RING
KEY MATRIX (AUTO FOCUS SWITCH)
FOCUS RING
MAN FOCUS 1, 2
ZOOM SW
ZOOM SWITCH
S1-4
ZOOM LENS
M904 IRIS MOTOR
CD-61 BOARD
(See Page 97)
CCD IMAGER
CCD OUT
IC901
ZOOM SW
CS-31 BOARD
IC802
IC803
IC805
IC707
SIGNAL SEPARATION AGC
SY OUT
A/D CONV
10
D0-D9
CAMERA CORE (DIGITAL CAMERA PROCESS)
IC804
IC801
V DRIVE
TIMING GENERATOR
V1-V4, V SUB
H1, H2, PG
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
HALL
M905 (1/2) FOCUS MOTOR
M
H
ZOOM W/T
FOCUS M A, B, Ā, B̄
ZOOM ENC
HALL (+)
DRIVE (+)
ZOOM W, T
IC851
IC852
IC854
IC709
IC702
ADJUST VOLTAGE
EVR
CAM SO, CAM SI, CAM SCK
ZOOM MOTOR DRIVE
ZOOM FWD, REV
IRIS DRIVE
HALL AMP
IRIS PWM
HALL OUT
CAMERA CONTROL
IC705
OPG
IC855
ZOOM POSITION AMP
ZOOM POS
IC712
EEPROM
IC704
IC703
SYNC GENERATOR
ON SCREEN DISPLAY
IC853
FOCUS MOTOR DRIVE
FOC IN 1, 2, 3, 4
IC706
FOCUS PRE DRIVE
MAN FOCUS 1, 2
DATA TO SLVE, DATA TO MAST, SCK
(See Page 105, 110, 114, 117, 119)
(See Page 145)
PJ-45 BOARD(2/2)
S551
IN
OUT
J550
VIDEO
RFU DC OUT
AUDIO
5V
AUDIO I/O L
(See Page 127, 132, 135)
VA-71 BOARD
DATA TO SLIVE, DATA TO MAST, SCK
IC201, IC202
IC205, IC206
IC051, IC054
IC203, IC204
CAM Y
VIDEO IN
VIDEO OUT
EVF OUT
Y PROCESS
PB RF
Y RF
ADJUST VOLTAGE
EVR
IC301
CAM C
C PROCESS
PB C RF
REC C RF
REC/PB AMP
1CH A
2CH A
IC101
RF SWP
CH1
CH2
FLYING ERASE
FLYING ERASE OSC
FE
MA-93 BOARD
IC400
MIC UNIT
J400 MIC
MIC AMP
MIC SIG
IC401
AUDIO I/O L.R
MIC SIG
AFM AUDIO PROCESS
REC AFM
PB RF
EP L OUT
AUDIO MIX OUT
VIDEO OUT
IC401
REMOTE CONTROL RECIEVER
SIRCS
(See Page 145)
REC ATF
IC501
PB RF
ATF SERVO
PB SP/LP SET
CLOG SET
REF PILOT
ATF ERROR
(S

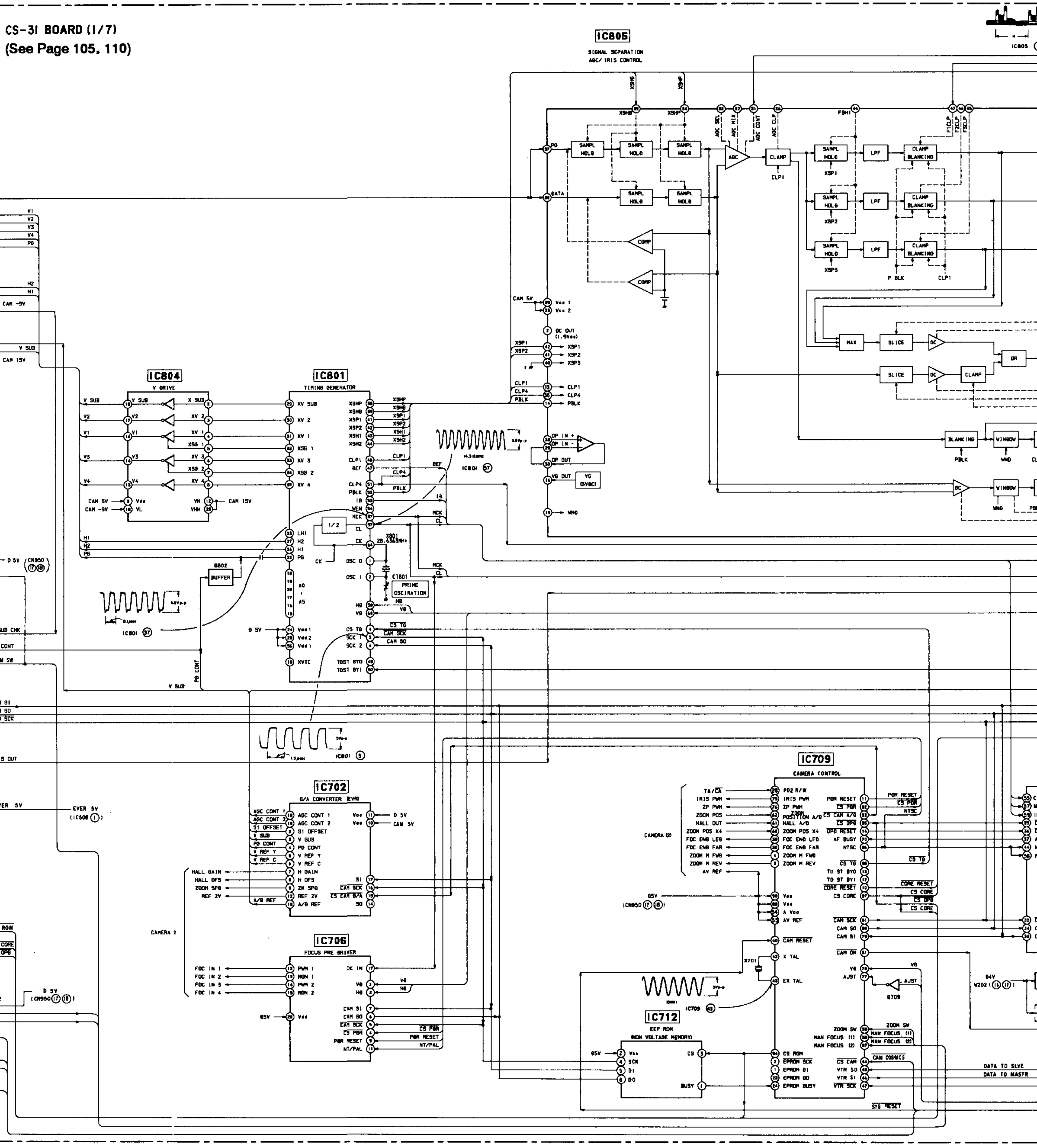

IC707
ERA CORE
TAL CAMERA
ROCESS
CAM Y
CAM C
IC703
SYNC GENERATOR
ON SCREEN DISPLAY
DOS.DS VOB.VOW
DATA TO SLVE, DATA TO MAST, SCK
IC510
LOADING MOTOR DRIVE
IC503
MECHANISM CONTROL/SERVO
IC511
EEPROM
M903 LOADING MOTOR
LOAD, UN LOAD
LOAD , UN LOAD
(See Page 139)
S001 MODE SWITCH
S005 CC DOWN
FP-442 BOARD
DEW SENSOR
MSW 0-2
CC DOWN
DEW SENS
VIDEO , AUDIO , SERVO CONTROL SIG.
MECANISM CONTROL
IC509
SIRCS
SIRCS CONTROL
Q001
D001 TAPE LED
TAPE TOP SENSOR
TOP SENS
TAPE TOP DETECT
TOP SENS
H001 T REEL FG SENSOR
T REEL (+) , (-)
T REEL FG AMP
T REEL FG
H002 S REEL FG SENSOR
S REEL (+) , (-)
S REEL FG AMP
S REEL FG
CHIF SELE
Q002
TAPE END SENSOR
END SENS
TAPE END DETECT
END SENS
T/E LED
S002 ME/MP REC PROOF
ME/MP SW
REC PROOF SW
IN/OUT SW
LS-33 BOARD
(See Page 139)
(See Page 140)
IC501 (1/2)
CLOG PB SP/LP DET
D PG , D FG
D PG , D FG
WAVE SHAPER
DRUM PG , DRUM FG
RF SWP
VI SWP
SL-22 BOARD
CH1
FLYING ERASE
M901 DRUM MOTOR
DRUM PG, FG
IC505 (2/2)
DRUM MOTOR DRIVE
DRUM VS
PS-282 BOARD (2/2)
(See Page 153)
DRUM PWM DRIVE
DRUM ERROR
IC505 (1/2)
LPF
DRUM PWM
EVF OUT
LANC SI
LANC SO
IC502
LANC I/O
LANC SIG
SERVO
M902 CAPSTAN MOTOR
IC001
CAPSTAN FG
CAPSTAN MOTOR DRIVE
CAP VS
CAPSTAN PWM DRIVE
CAP ERROR
LPF
CAP PWM
CFG (+), (-)
WAVE SHAPER
CAP FG
(See Page 139)
CAP FG
REF PILOT
ATF ERROR

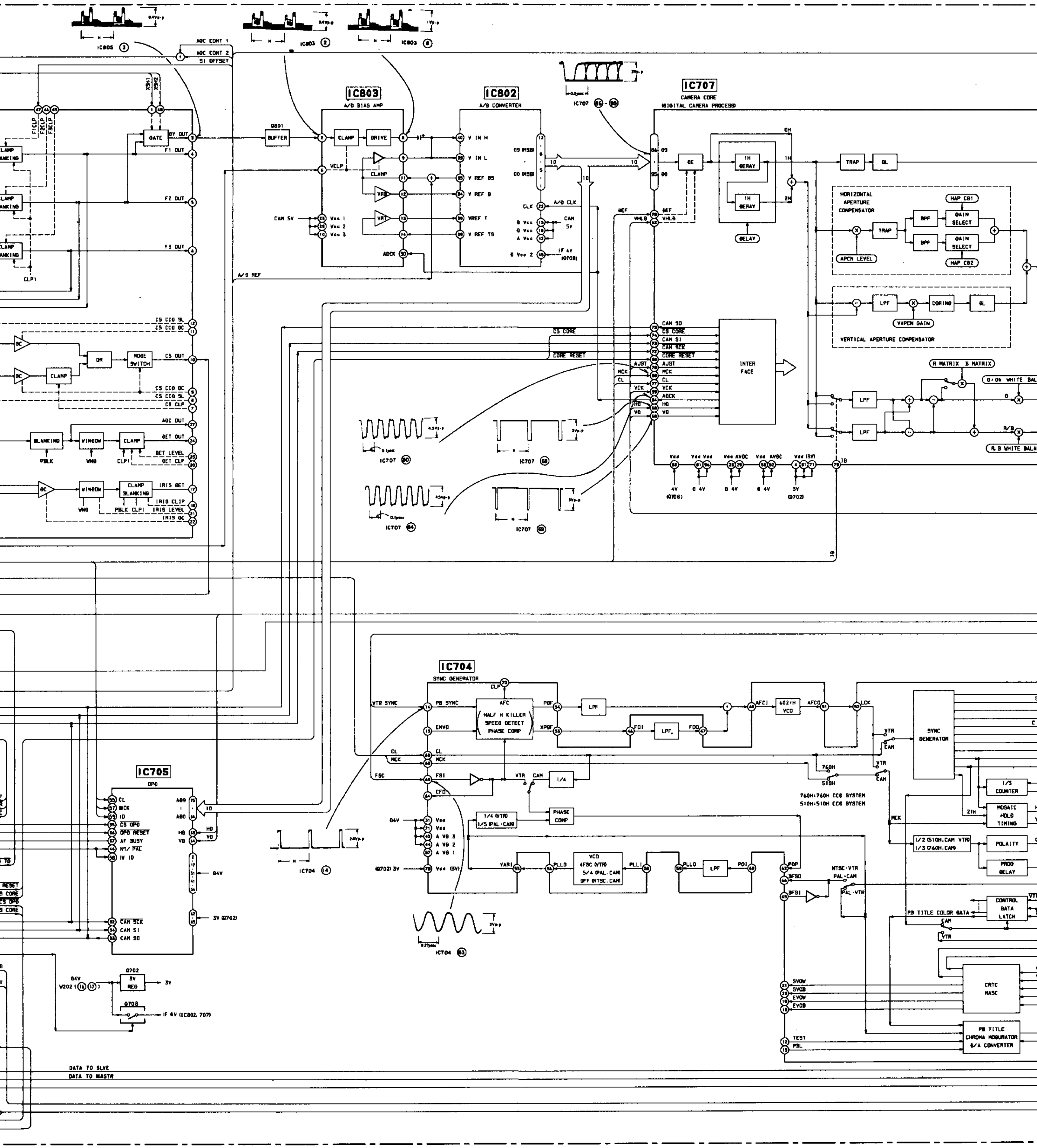

(See Page 146)
CK-47 BOARD
(See Page 147)
DK-20 BOARD
S561~563
KEY MATRIX
COUNTER FUNCTION SWITCH
VF-44 BOARD
(See Page 151)
DY
H
V
GH1 . GH2
T501
HV
H
H OUT
IC511
EEPROM
IC506
S560, 564~568
KEY MATRIX
CAMERA FUNCTION SWITCH
PK-30 BOARD
S540~541
KEY MATRIX
POWER, REMOTE BUZZER SWITCH
(See Page 146)
S501,502
KEY MATRIX
EDIT SEARCH SWITCH
CRT
G1
CRT DRIVE
IC501
EVF VIDEO
IC509
SIRCS
SIRCS CONTROL
MODE CONTROL (MASTER)
K OUT 0~5
K IN 0~6
VK-22 BOARD
(See Page 146)
SW-200 BOARD
S580,581
KEY MATRIX
START/STOP, STANDBY SWITCH
(See Page 147)
CHIP SELECT
BUZZER
CAM ON
VTR ON
VDD
S570~576
KEY MATRIX
VTR FUNCTION SWITCH
PJ-45 BOARD(1/2)
S550
KEY MATRIX
EDIT SWITCH
S551(1/2)
AUDIO VIDEO IN/OUT SWITCH
BU550
BUZZER
(See Page 145)
IC507
BACK UP SWITCH
EVER 5V
L13V
LITHIUM BATTERY
EVF OUT
PS-282 BOARD(1/2) (See Page 153)
LANC SIG
LANC SIG
J951
REMOTE
CAM ON
IC950
15V
-9V
CAM 5V
CAMERA DC/DC CONVERTER
D4V
D5V
MT 5V
EVF 5V
AUDIO 5V
VIDEO 5V
VTR DC/DC CONVERTER
J950
EASY CONNECTER
VIDEO OUT
AUDIO MIX OUT
EP L OUT
VTR ON
J952
EARPHONE
MOTOR UNREG
UNREG
IC508
EVER 5V
5V REG

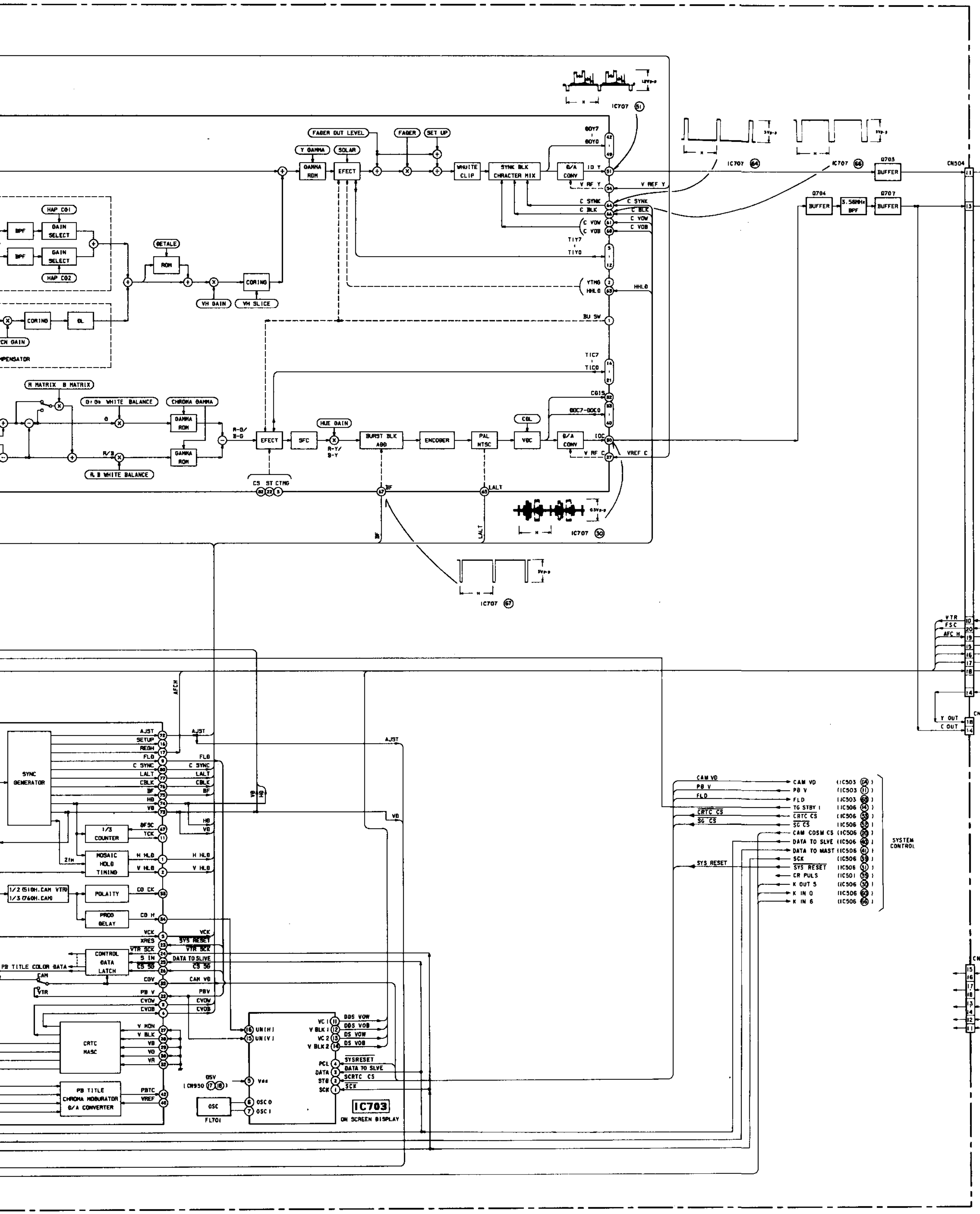
3-3. CAMERA (1) BLOCK DIAGRAM


CS-31 BOARD (1/7)
(See Page 105, 110)
CD-61 BOARD
(See Page 97)
IC901
CCD IMAGER
Q903
BUFFER
CCD OUT
V1
V2
V3
V4
PG
VDD 1
VDD 2
VOO
VSS
V SUB
VL
H1
H2
Q901, 902
V SUB
REG
D901
23V
RECT
CN901
CN801
CCD OUT
-9V
V SUB CHK
CAM -9V
V SUB CONT
V SUB
15V
CAM 15V
IC901 ⑤,⑥
IC901 ③,④
IC901 ⑱
IC901 ⑬
IC901 ⑰
Q903 ⑤
5Vp-p
9Vp-p
0.7Vp-p
H
IC804
V DRIVE
X SUB
XV 2
XV 1
XSG 1
XV 3
XSG 2
XV 4
CAM 5V
VDD
VL
VH
VHH
Q802
BUFFER
IC801 ㊲
ZOOM SW
CN903
CN902
ZOOM SW
ZOOM T1
ZOOM T2
ZOOM W1
ZOOM W2
D 5V
CN950 ⑰⑱
CN701
PG CONT
CAM SI
CAM SO
CAM SCK
IRIS OUT
FOR CHECK
EVER 5V
IC508 ①
CS ROM
CS CONE
CS OPD
FOCUS RING
CN852
AV REF
MAN FOCUS (1)
MAN FOCUS (2)
AUTO FOCUS ON/OFF
K OUT 5
K IN 6
HALL GAIN
HALL OFS
ZOOM SPD
REF 2V
CAMERA 2
FOC IN 1
FOC IN 2
FOC IN 3
FOC IN 4

CS-31 BOARD (1/7)
(See Page 105, 110)


IC805
SIGNAL SEPARATION
AGC/ IRIS CONTROL
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
COMP
MAX
SLICE
OR
BLANKING
WINDOW
IC804
V DRIVE
IC801
TIMING GENERATOR
X801 28.6363MHz
CT801
PRIME OSCIRATION
Q802
BUFFER
1/2
IC702
D/A CONVERTER (EVR)
IC706
FOCUS PRE DRIVER
IC709
CAMERA CONTROL
IC712
EEP ROM
(NON VOLTAGE MEMORY)
X701
Q709
CAMERA (2)
CAMERA 2
CAM 5V
CAM -9V
CAM 15V
D 5V (CN950 ⑰⑱)
EVER 5V (IC508 ①)
B5V
V SUB
PG
H1
H2
DATA TO SLVE
DATA TO MASTR
SYS RESET
IC801 ㊲
IC801 ⑤
IC709 ㊸


IC805 ③
AGC CONT 1
AGC CONT 2
S1 OFFSET
IC803 ②
IC803 ⑧
IC707 86 - 90
IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
GATE
BY OUT
F1 OUT
F2 OUT
F3 OUT
Q801
BUFFER
CLAMP
DRIVE
VCLP
V IN H
V IN L
V REF BS
V REF B
VREF T
V REF TS
CAM 5V
Vcc 1
Vcc 2
Vcc 3
ADCK
D9 (MSB)
D0 (MSB)
CLK
A/D CLK
D Vcc
D Vcc
A Vcc
D Vcc 2
IF 4V (Q708)
A/D REF
DEF
VHLD
D9
D0
DE
1H DELAY
1H DELAY
DELAY
OH
1H
2H
TRAP
DL
HORIZONTAL APERTURE COMPENSATOR
HAP CO1
HAP CO2
BPF
GAIN SELECT
APCN LEVEL
LPF
CORING
VAPCN GAIN
VERTICAL APERTURE COMPENSATOR
R MATRIX B MATRIX
G/G₀ WHITE BAL
R, B WHITE BAL
R/B
CAM SO
CS CORE
CAM SI
CAM SCK
CORE RESET
AJST
MCK
CL
VCK
ADCK
HD
VD
INTER FACE
Vdd
Vdd Vdd
Vdd AVDC
Vdd AVDC
Vdd (3V)
4V (Q708)
D 4V
D 4V
D 4V
3V (Q702)
CS CCD SL
CS CCD DC
DC
OR
MODE SWITCH
CS OUT
CLAMP
CS CCD DC
CS CCD SL
CS CLP
AGC OUT
BLANKING
WINDOW
CLAMP
DET OUT
PBLK
WND
CLP1
DET LEVEL
DET CLP
IRIS DET
CLAMP BLANKING
IRIS CLIP
IRIS LEVEL
IRIS DC
CLAMP BLANKING
CLP1
F1CLP F2CLP F3CLP
XSH1 XSH2
IC707 80
IC707 68
IC707 84
IC707 69
4.5Vp-p
3Vp-p
0.1μsec
IC704
SYNC GENERATOR
CLP
VTR SYNC
PB SYNC
AFC
HALF H KILLER
SPEED DETECT
PHASE COMP
PDF
XPDF
LPF
FD1
LPF
FDO
AFCI
AFCO
602fH VCO
LCK
ENVD
CL
MCK
FSC
FSI
CFO
VTR CAM
1/4
PHASE COMP
1/4 (VTR)
1/5 (PAL-CAM)
D4V
Vdd
Vdd
A VD 3
A VD 2
A VD 1
(Q702) 3V
Vdd (3V)
VARI
PLLD
VCO
4FSC (VTR)
5/4 (PAL-CAM)
OFF (NTSC-CAM)
PLLI
PLLO
LPF
PDI
PDP
3FSO
3FSI
NTSC-VTR
PAL-CAM
PAL-VTR
760H
510H
760H:760H CCD SYSTEM
510H:510H CCD SYSTEM
VTR
CAM
SYNC GENERATOR
1/3 COUNTER
2fH
MOSAIC HOLD TIMING
MCK
1/2 (510H.CAM VTR)
1/3 (760H.CAM)
POLARITY
PROG DELAY
PB TITLE COLOR DATA
CONTROL DATA LATCH
CAM
VTR
CRTC MASC
SVDW
SVDB
EVDW
EVDB
TEST
PBL
PB TITLE CHROMA MODURATOR D/A CONVERTER
IC705
DPO
CL
MCK
ID
CS DPO
DPO RESET
AF BUSY
NT/PAL
IV ID
AD9
AD0
HD
VD
D4V
3V (Q702)
CAM SCK
CAM SI
CAM SO
IC704 ⑭
2.8Vp-p
IC704 63
3Vp-p
0.2μsec
Q702
3V REG
3V
D4V
W202 ① ⑰
Q708
IF 4V (IC802, 707)
DATA TO SLVE
DATA TO MASTR
CS CORE
CORE RESET
CS DPO
CS CORE
10



FADER OUT LEVEL
FADER
SET UP
Y GAMMA
SOLAR
GAMMA ROM
EFECT
WHITE CLIP
SYNK BLK CHRACTER MIX
D/A CONV
HAP C01
GAIN SELECT
BPF
HAP C02
DETALE
ROM
CORING
VH GAIN
VH SLICE
DL
CN GAIN
MPENSATOR
R MATRIX B MATRIX
G:Gb WHITE BALANCE
CHROMA GAMMA
GAMMA ROM
R,B WHITE BALANCE
R-G/B-G
EFECT
SFC
HUE GAIN
R-Y/B-Y
BURST BLK ADD
ENCODER
PAL NTSC
CBL
VOC
D/A CONV
CS ST CTMG
BF
LALT
IC707 (51)
IC707 (64)
IC707 (66)
IC707 (30)
IC707 (67)
1Vp-p
3Vp-p
0.5Vp-p
H
DOY7
DOY0
IO Y
V RF Y
V REF Y
C SYNK
C BLK
C VOW
C VOB
TIY7
TIY0
YTMG
HHLD
BU SW
TIC7
TIC0
CDIS
DOC7-DOC0
IOC
V RF C
VREF C
Q705
BUFFER
Q704
3.58MHz BPF
Q707
CN504
CAM Y
CAM C
VIDEO (1) (VA-71)
VTR
FSC
AFC H
CAM FSC
DDS VOW
DDS VOB
DS VOW
DS VOB
Y CHK
CN701
Y OUT
C OUT
FOR CHECK
AFCH
SYNC GENERATOR
AJST
SETUP
REGH
FLD
C SYNC
LALT
CBLK
BF
HD
VD
1/3 COUNTER
BFSC
TCK
2fH
MOSAIC HOLD TIMING
H HLD
V HLD
1/2 (510H.CAM VTR)
1/3 (760H.CAM)
POLAITY
CD CK
PROG DELAY
CD H
VCK
XRES
SYS RESET
VTR SCK
S IN
CS SG
DATA TO SLIVE
PB TITLE COLOR DATA
CONTROL DATA LATCH
CAM
VTR
CDV
CAM VD
PB V
PBV
CVOW
CVOB
CRTC MASC
V MON
V BLK
VD
VR
PB TITLE CHROMA MODURATOR D/A CONVERTER
PBTC
VREF
UN(H)
UN(V)
VC 1
V BLK 1
VC 2
V BLK 2
PCL
DATA
STB
SCK
SYSRESET
DATA TO SLVE
SCRTC CS
D5V
(CN950 (17)(18))
Vdd
OSC
FL701
OSC O
OSC I
IC703
ON SCREEN DISPLAY
CAM VD
PB V
FLD
TG STBY I
CRTC CS
SG CS
CAM COSM CS
DATA TO SLVE
DATA TO MAST
SCK
SYS RESET
CR PULS
K OUT 5
K IN 0
K IN 6
(IC503 (64))
(IC503 (11))
(IC503 (63))
(IC506 (14))
(IC506 (53))
(IC506 (52))
(IC506 (20))
(IC506 (40))
(IC506 (41))
(IC506 (39))
(IC506 (51))
(IC501 (35))
(IC506 (30))
(IC506 (60))
(IC506 (56))
SYSTEM CONTROL
CN950
D4V
D5V
CAM 5V
-9V
15V
POWER (PS-28Z)

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-31 BOARD: CXP80624-256Q/261Q/269Q/278Q)

Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	EPROM SCK	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally “H”. 16.6 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally “H”. 16.6 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	CORE RESET	O	Camera core (IC707 on CS-31 board) reset signal. Normally “H”. “L” when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-31 board) reset signal. Normally “H”. “L” when reset.
12	TG STBY1		Not used.
13	TG SYBY2		
14	OPD RESET	O	OPD (IC705 on CS-31 board) reset signal. “H”: camera mode. “L”: VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	EPROM BUSY	I	BUSY signal from EEPROM. Normally “H”. “L” pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally “L”.
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally “L”.
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally “H” (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally “H”. “L” when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	CS CAM	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	VTR SCK	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		

Pin No.	
51	PF
52	AV
53	AV
54	AV
55	PF
56	PF
57	M
58	M
59	ZC
60	ZC
61	H
62	ZC
63	PC
64	PC
65	PC
66	V
67	PE
68	DI
69	FC
70	AI
71	PE
72	PE
73	PE
74	PE
75	IR
76	ZI
77	A
78	V
79	C
80	C
81	C
82	C
83	PI
84	PI
85	PI
86	PI
87	PI
88	G
89	V
90	V
91	P
92	$\overline{\text{C}}$
93	$\overline{\text{C}}$
94	$\overline{\text{C}}$
95	$\overline{\text{C}}$
96	$\overline{\text{N}}$
97	$\overline{\text{C}}$
98	$\overline{\text{C}}$
99	J
100	P

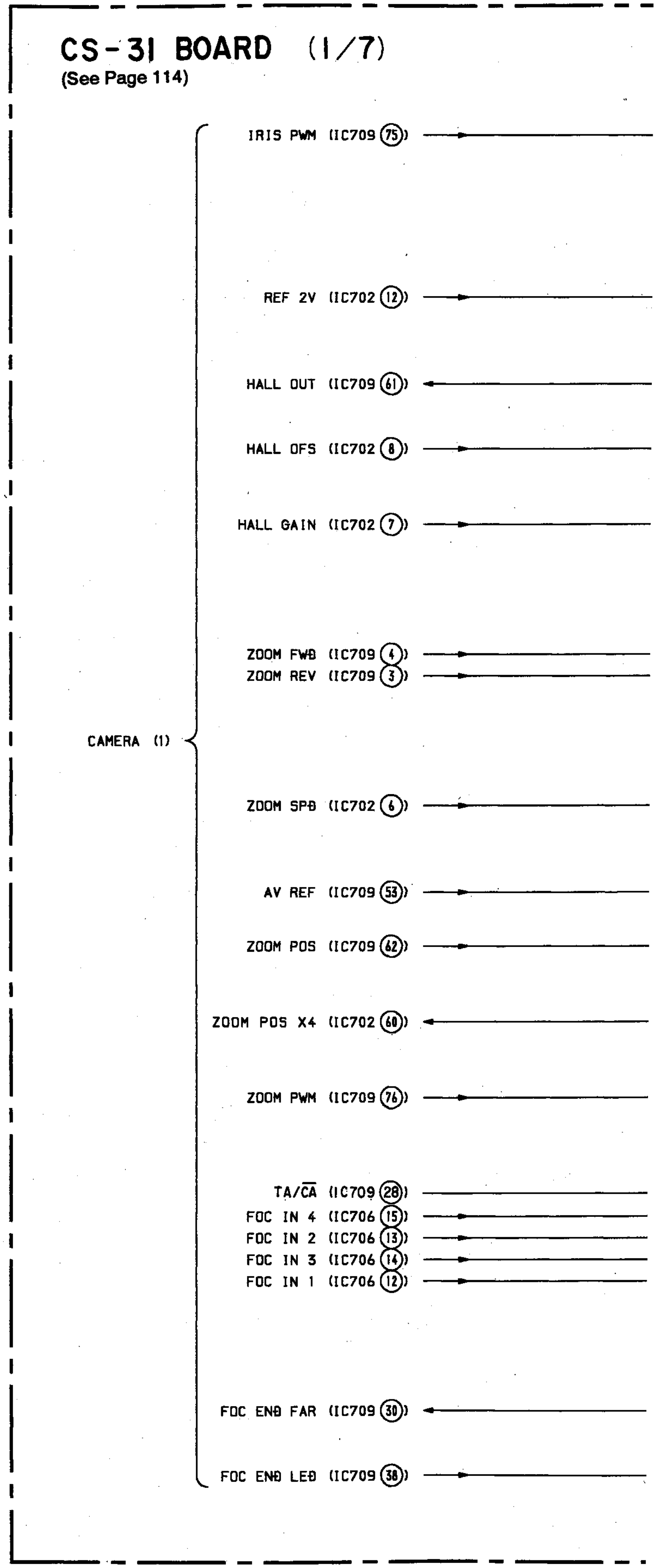
)/269Q/278Q)

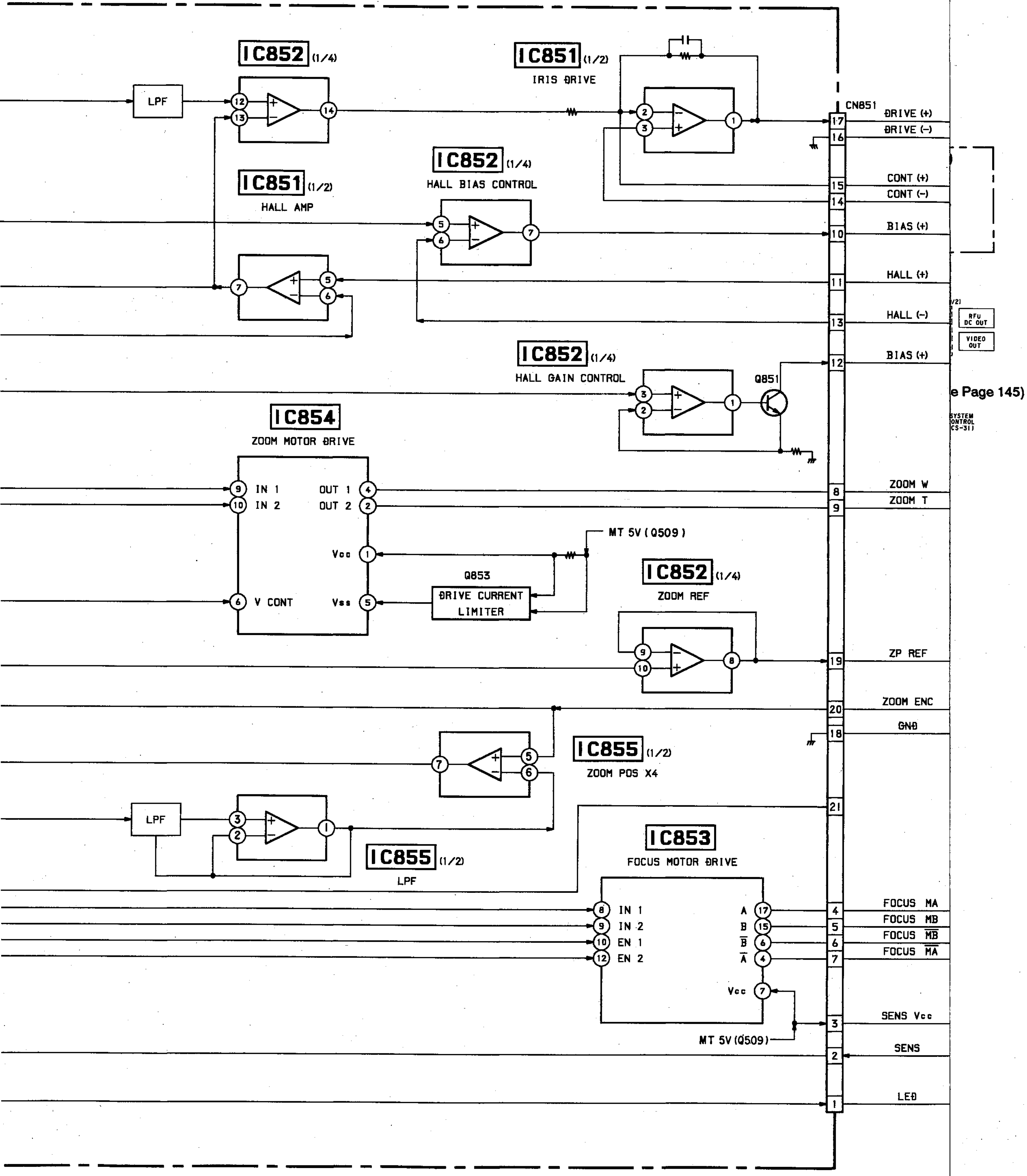
n rotating to WIDE.
n rotating to TELE.
set.
ı reset.
e.
iting.

Pin No.	Signal	I/O	Function
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	CAM SCK	O	Serial data transfer clock
82	CS CAM		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on CS-31 board)
93	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on CS-31 board)
94	$\overline{\text{CS ROM}}$	O	Chip select signal to EEPROM (IC712 on CS-31 board)
95	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on CS-31 board)
96	$\overline{\text{NTSC}}$	O	NTSC: "L", PAL: "H"
97	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on CS-31 board)
98	$\overline{\text{CS TG}}$	O	Select signal to timing generator (IC801 on CS-31 board)
99	J STB		Not used.
100	PB6		

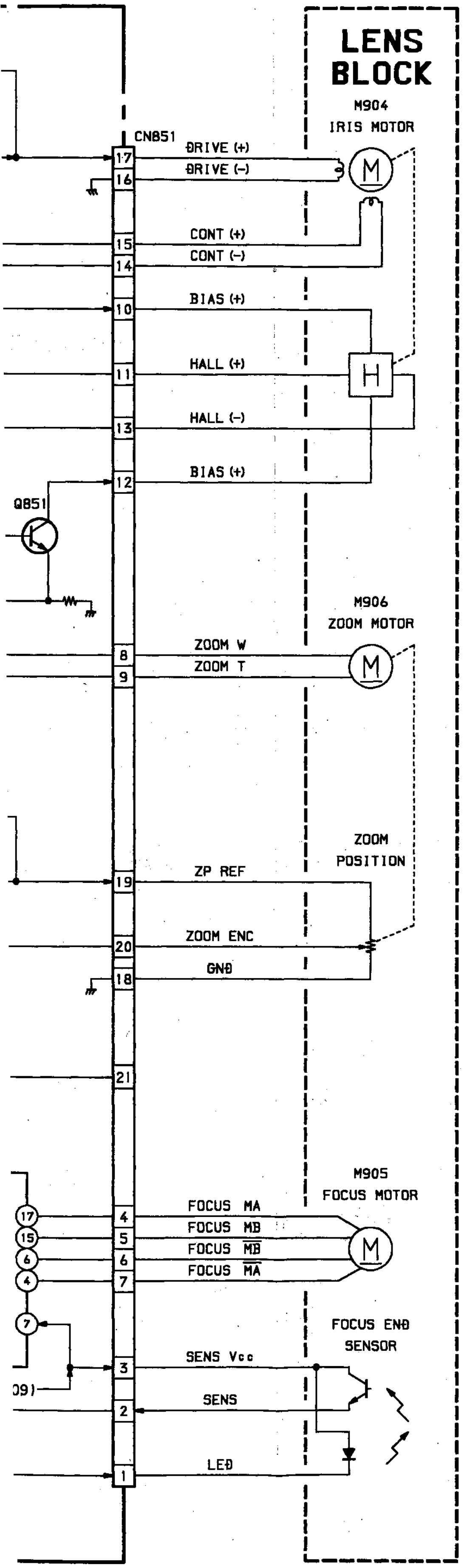
DE, 1.9V: WIDE, 2.5V: no input.
3V (TELE end).
se).
x. 2.4V (TELE end).
PWM signal
rd)
l)
)

3-5. CAMERA (2) BLOCK DIAGRAM

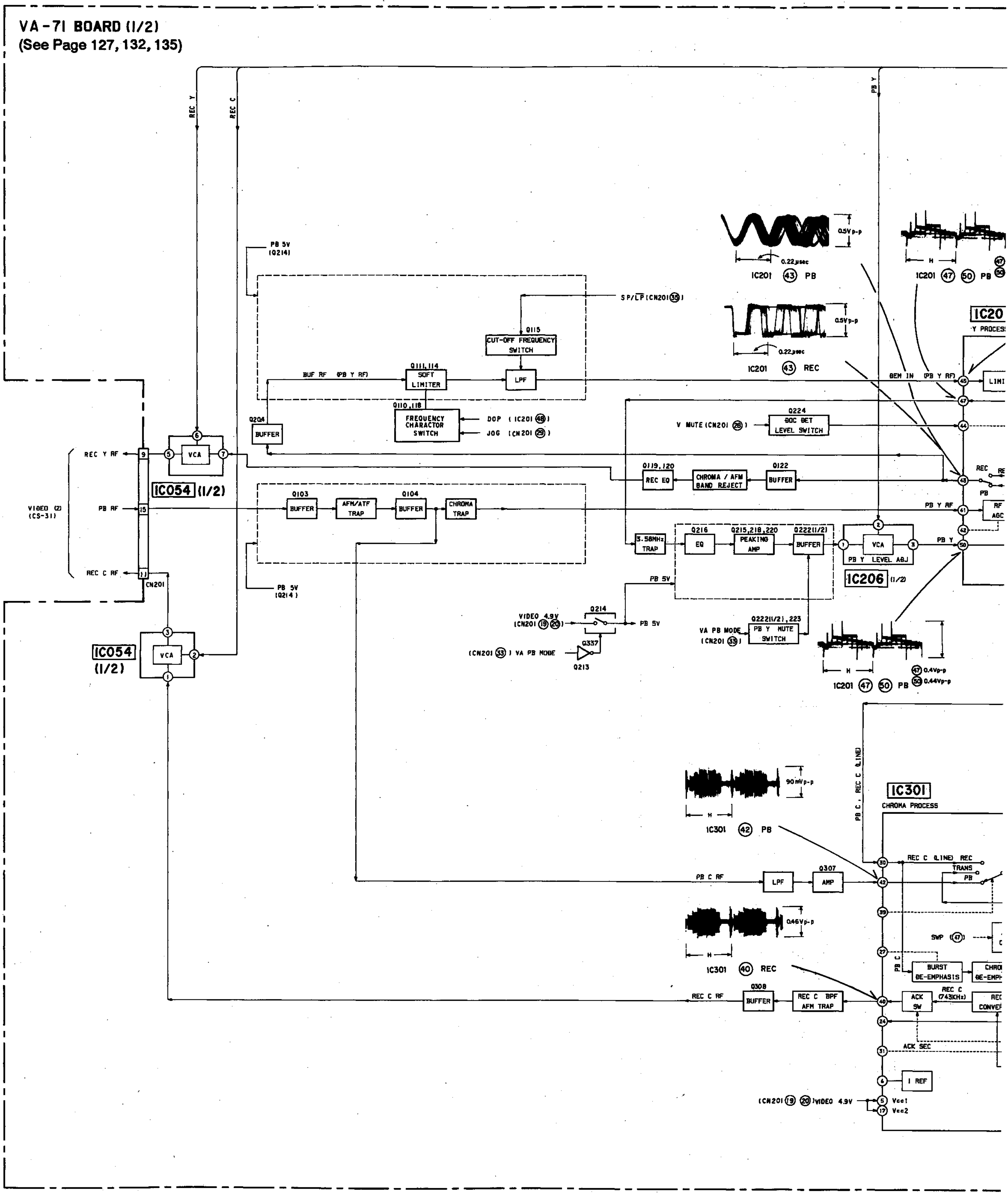

CS-31 BOARD (1/7)
(See Page 114)
CAMERA (1)
IRIS PWM (IC709 ⑺⑸)
REF 2V (IC702 ⑿)
HALL OUT (IC709 ⑹⑴)
HALL OFS (IC702 ⑧)
HALL GAIN (IC702 ⑦)
ZOOM FWD (IC709 ④)
ZOOM REV (IC709 ③)
ZOOM SPD (IC702 ⑥)
AV REF (IC709 (53))
ZOOM POS (IC709 (62))
ZOOM POS X4 (IC702 (60))
ZOOM PWM (IC709 (76))
TA/CA (IC709 ㉘)
FOC IN 4 (IC706 ⑮)
FOC IN 2 (IC706 ⑬)
FOC IN 3 (IC706 ⑭)
FOC IN 1 (IC706 ⑫)
FOC END FAR (IC709 ㉚)
FOC END LED (IC709 (38))

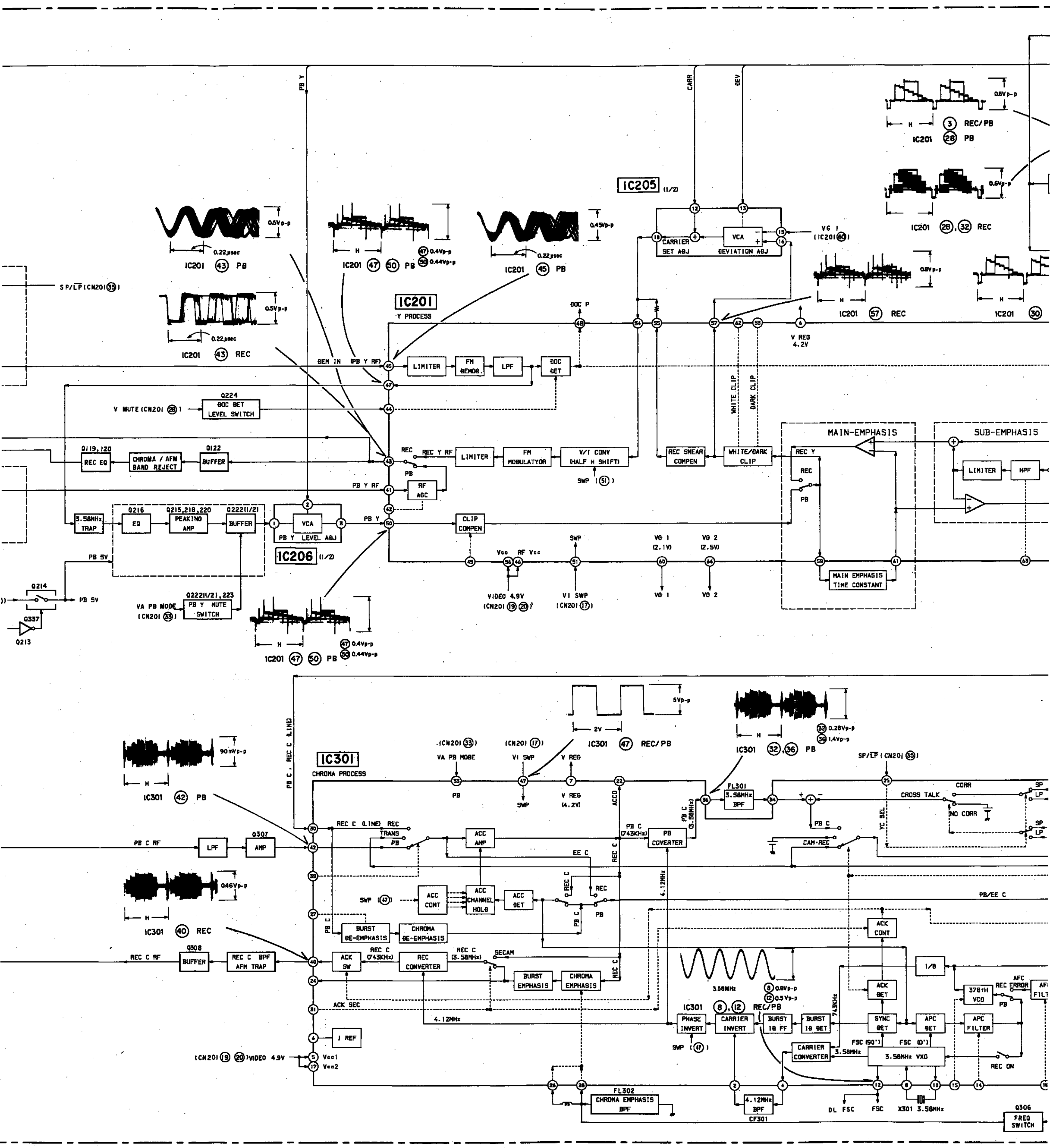


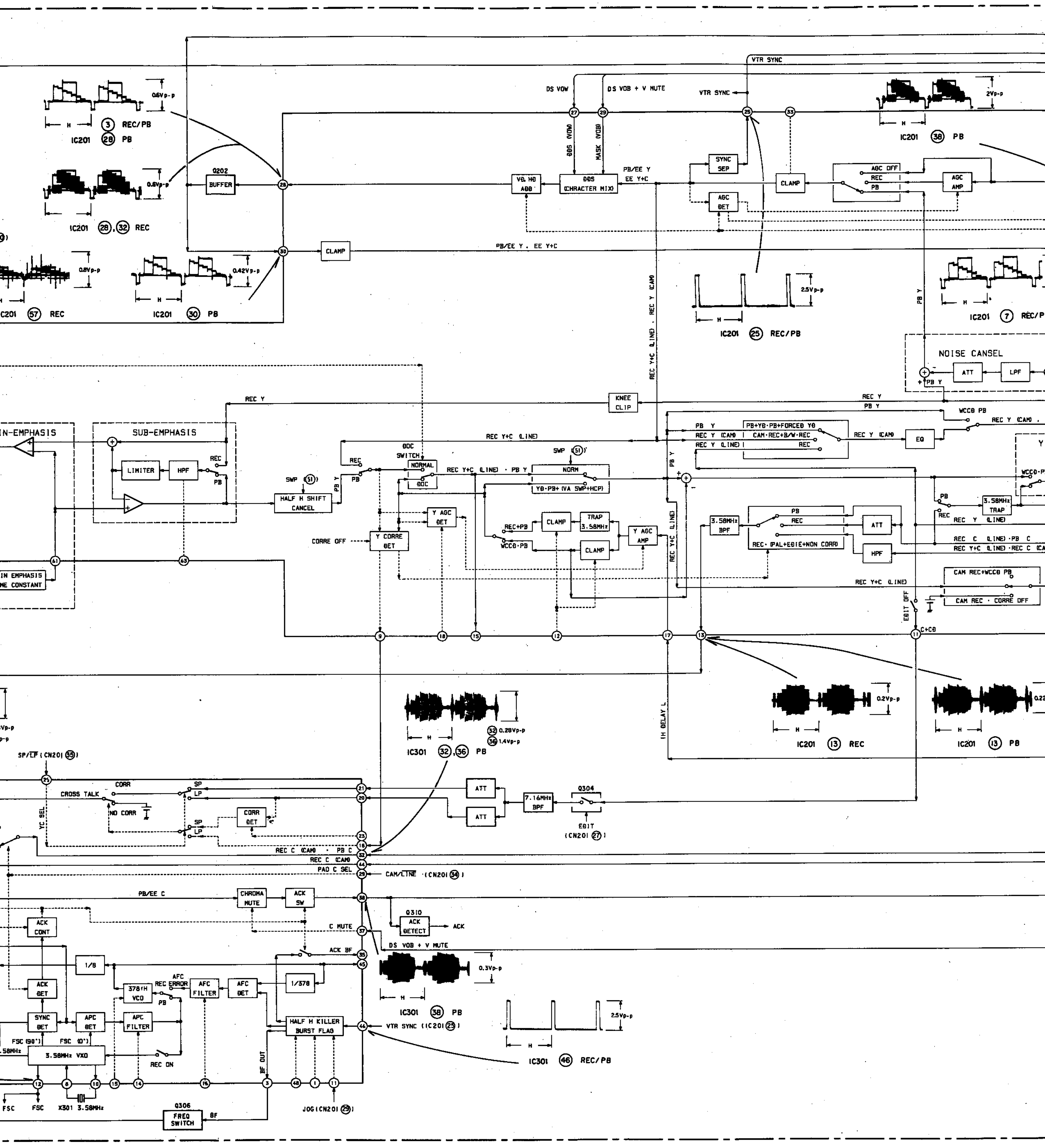
IC852 (1/4)
LPF
IC851 (1/2)
IRIS DRIVE
IC851 (1/2)
HALL AMP
IC852 (1/4)
HALL BIAS CONTROL
IC852 (1/4)
HALL GAIN CONTROL
Q851
IC854
ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
V CONT
Vss
MT 5V (Q509)
Q853
DRIVE CURRENT LIMITER
IC852 (1/4)
ZOOM REF
IC855 (1/2)
ZOOM POS X4
LPF
IC855 (1/2)
LPF
IC853
FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
B̄
Ā
Vcc
MT 5V (Q509)
CN851
DRIVE (+)
DRIVE (–)
CONT (+)
CONT (–)
BIAS (+)
HALL (+)
HALL (–)
BIAS (+)
ZOOM W
ZOOM T
ZP REF
ZOOM ENC
GND
FOCUS MA
FOCUS MB
FOCUS M̄B̄
FOCUS M̄Ā
SENS Vcc
SENS
LED
RFU DC OUT
VIDEO OUT
e Page 145)
SYSTEM CONTROL CS-31


LENS BLOCK
M904
IRIS MOTOR
CN851
DRIVE (+)
DRIVE (–)
CONT (+)
CONT (–)
BIAS (+)
HALL (+)
HALL (–)
BIAS (+)
Q851
M906
ZOOM MOTOR
ZOOM W
ZOOM T
ZOOM POSITION
ZP REF
ZOOM ENC
GND
M905
FOCUS MOTOR
FOCUS MA
FOCUS MB
FOCUS $\overline{MB}$
FOCUS $\overline{MA}$
FOCUS END SENSOR
SENS Vcc
SENS
LED
17
16
15
14
10
11
13
12
8
9
19
20
18
21
4
5
6
7
3
2
1
H
M
09)

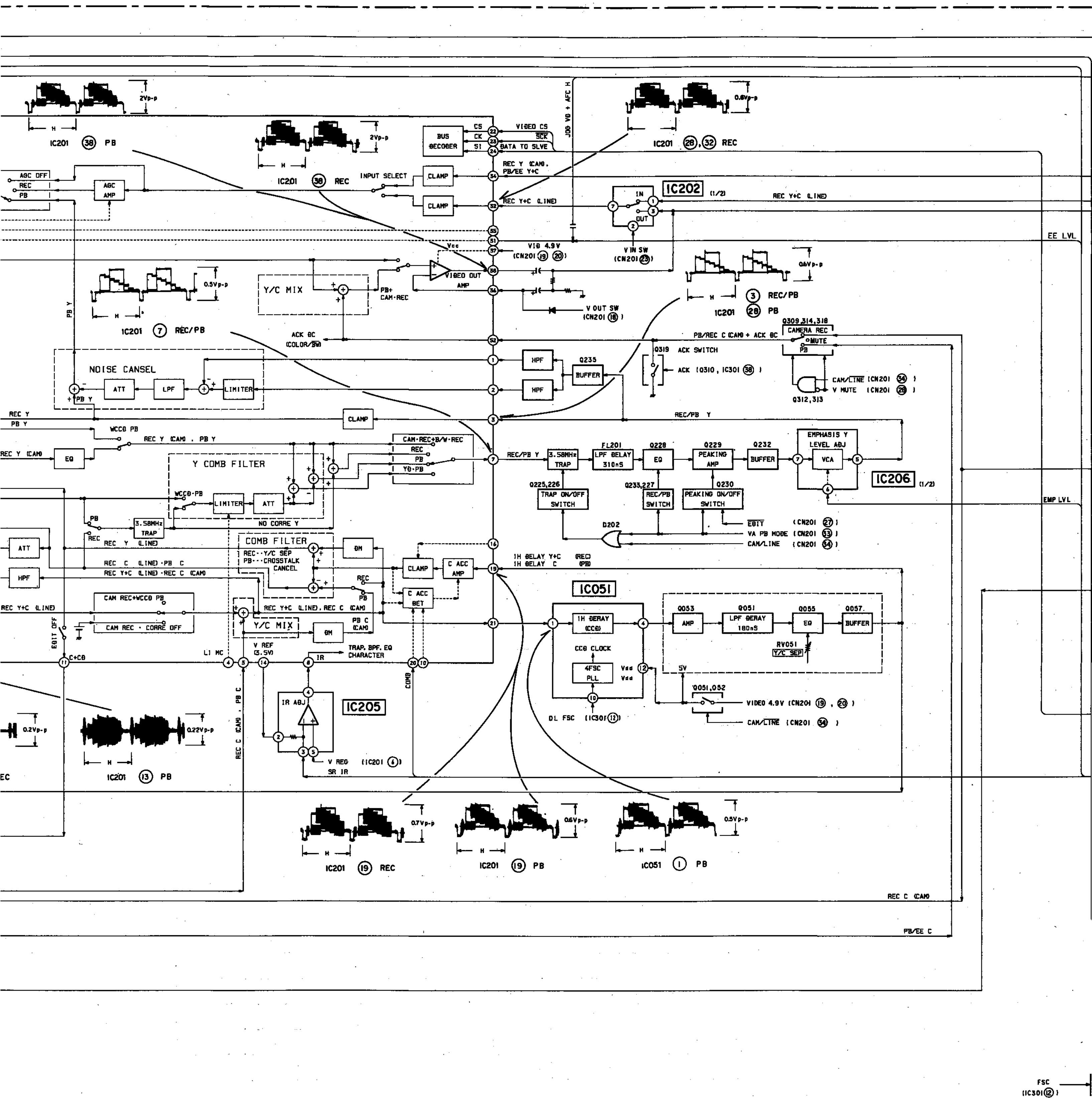
3-6. VIDEO (1) BLOCK DIAGRAM


VA-71 BOARD (1/2)
(See Page 127, 132, 135)
REC Y
REC C
PB Y
PB 5V (Q214)
SP/LP (CN201 ㉟)
Q115
CUT-OFF FREQUENCY SWITCH
Q111, 114
SOFT LIMITER
LPF
BUF RF (PB Y RF)
Q110, 118
FREQUENCY CHARACTOR SWITCH
DOP (IC201 ㊽)
JOG (CN201 ㉙)
Q204
BUFFER
REC Y RF
VIDEO (2) (CS-31)
PB RF
REC C RF
CN201
IC054 (1/2)
VCA
Q103
BUFFER
AFM/ATF TRAP
Q104
BUFFER
CHROMA TRAP
PB 5V (Q214)
VIDEO 4.9V (CN201 ⑲ ⑳)
Q214
PB 5V
Q337
(CN201 ㉝) VA PB MODE
Q213
0.5Vp-p
0.22μsec
IC201 ㊸ PB
0.5Vp-p
0.22μsec
IC201 ㊸ REC
H
IC201 ㊼ ㊿ PB
IC20
Y PROCESS
SEM IN (PB Y RF)
LIMI
V MUTE (CN201 ㉘)
Q224
SOC SET LEVEL SWITCH
Q119, 120
REC EQ
CHROMA / AFM BAND REJECT
Q122
BUFFER
REC
PB
PB Y RF
RF AGC
3.58MHz TRAP
Q216
EQ
Q215, 218, 220
PEAKING AMP
Q222 (1/2)
BUFFER
PB 5V
VCA
PB Y LEVEL ADJ
IC206 (1/2)
PB Y
VA PB MODE (CN201 ㉝)
Q222 (1/2), 223
PB Y MUTE SWITCH
H
㊼ 0.4Vp-p
㊿ 0.44Vp-p
IC201 ㊼ ㊿ PB
IC054 (1/2)
VCA
90mVp-p
H
IC301 ㊷ PB
PB C, REC C (LINE)
IC301
CHROMA PROCESS
REC C (LINE) REC
TRANS
PB
PB C RF
LPF
Q307
AMP
0.46Vp-p
H
IC301 ㊵ REC
SWP (㊼)
PB C
BURST DE-EMPHASIS
CHRO DE-EMPH
Q308
REC C RF
BUFFER
REC C BPF AFM TRAP
ACK SW
REC C (743KHz)
REC CONVEF
ACK SEC
I REF
(CN201 ⑲ ⑳) VIDEO 4.9V
Vcc1
Vcc2

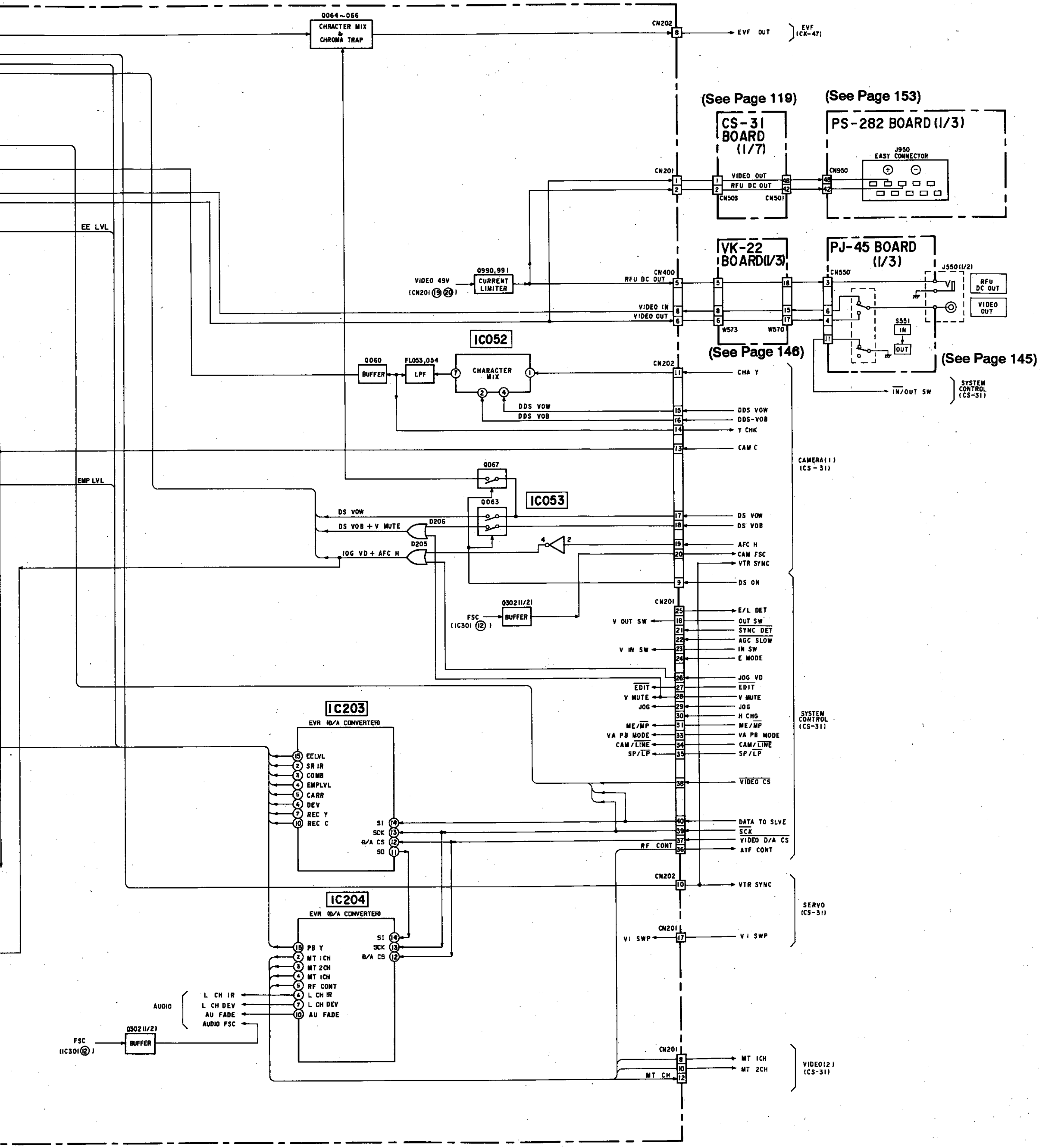

IC205 (1/2)
CARRIER SET ADJ
VCA DEVIATION ADJ
CARR
DEV
VG 1 (IC201 60)
IC201 Y PROCESS
DEM IN (PB Y RF)
LIMITER
FM DEMOD.
LPF
DOC DET
DOC P
V REG 4.2V
V MUTE (CN201 26)
Q224 DOC DET LEVEL SWITCH
Q119,120 REC EQ
CHROMA / AFM BAND REJECT
Q122 BUFFER
REC Y RF
FM MODULATOR
V/I CONV (HALF H SHIFT)
SWP (51)
REC SMEAR COMPEN
WHITE/DARK CLIP
WHITE CLIP
DARK CLIP
MAIN-EMPHASIS
SUB-EMPHASIS
REC Y
REC
PB
LIMITER
HPF
MAIN EMPHASIS TIME CONSTANT
PB Y RF
RF AGC
3.58MHz TRAP
Q216 EQ
Q215,218,220 PEAKING AMP
Q222(1/2) BUFFER
VCA
PB Y LEVEL ADJ
IC206 (1/2)
PB Y
CLIP COMPEN
PB 5V
Q214
Q337
Q213
VA PB MODE (CN201 33)
Q222(1/2),223 PB Y MUTE SWITCH
Vcc RF Vcc
VIDEO 4.9V (CN201 19 20)
SWP
VI SWP (CN201 17)
VG 1 (2.1V)
VG 2 (2.5V)
SP/LP (CN201 35)
IC201 43 PB
IC201 43 REC
IC201 47 50 PB
47 0.4Vp-p
50 0.44Vp-p
IC201 45 PB
IC201 3 REC/PB
IC201 28 PB
IC201 28, 32 REC
IC201 57 REC
IC201 30
0.5Vp-p
0.45Vp-p
0.6Vp-p
0.8Vp-p
0.22μsec
H
IC301 CHROMA PROCESS
VA PB MODE (CN201 33)
VI SWP (CN201 17)
V REG (4.2V)
IC301 47 REC/PB
5Vp-p
2V
IC301 32, 36 PB
32 0.28Vp-p
36 1.4Vp-p
IC301 42 PB
90mVp-p
IC301 40 REC
0.46Vp-p
PB C, REC C (LINE)
PB C RF
LPF
Q307 AMP
REC C (LINE) REC
TRANS
ACC AMP
PB C (743KHz)
PB COVERTER
ACCO
PB C (3.58MHz)
FL301 3.58MHz BPF
CROSS TALK
CORR
NO CORR
YC SEL
CAM-REC
EE C
ACC CONT
ACC CHANNEL HOLD
ACC DET
SWP (47)
PB/EE C
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
REC C RF
Q308 BUFFER
REC C BPF AFM TRAP
ACK SW
REC C (743KHz)
REC CONVERTER
REC C (3.58MHz)
SECAM
BURST EMPHASIS
CHROMA EMPHASIS
ACK SEC
4.12MHz
I REF
(CN201 19 20) VIDEO 4.9V
Vcc1
Vcc2
3.58MHz
8 0.8Vp-p
12 0.5Vp-p
IC301 8, 12 REC/PB
PHASE INVERT
CARRIER INVERT
BURST 1/8 FF
BURST 1/8 DET
743KHz
CARRIER CONVERTER
ACK CONT
ACK DET
1/8
SYNC DET
APC DET
APC FILTER
378fH VCO
AFC REC ERROR
FSC (90°)
FSC (0°)
3.58MHz VXO
REC ON
FL302 CHROMA EMPHASIS BPF
4.12MHz BPF CF301
DL FSC
FSC
X301 3.58MHz
Q306 FREQ SWITCH



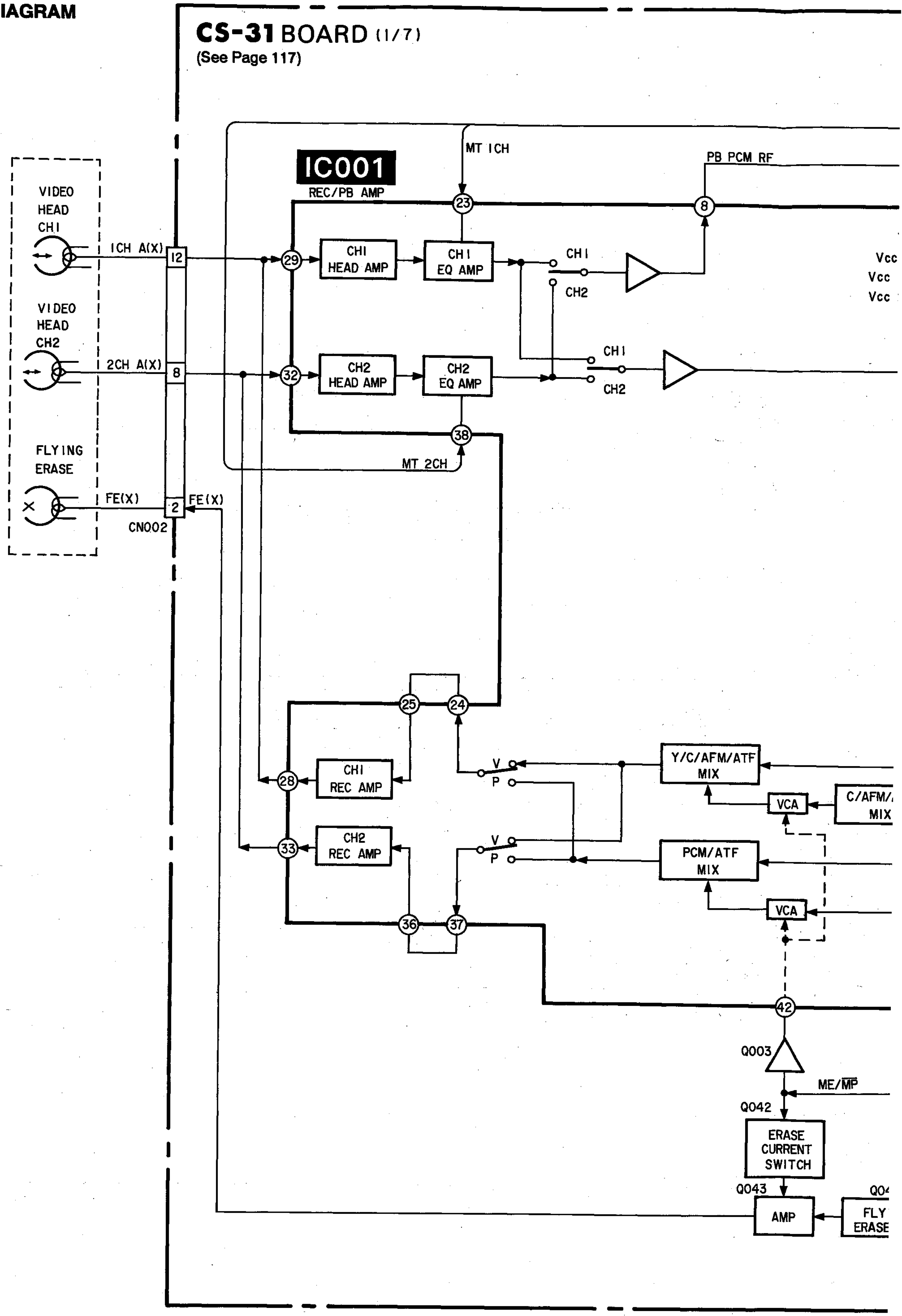
0.6Vp-p
H
③ REC/PB
IC201 ㉘ PB
0.6Vp-p
IC201 ㉘,㉜ REC
0.8Vp-p
IC201 (57) REC
0.42Vp-p
IC201 ㉚ PB
Q202
BUFFER
CLAMP
PB/EE Y . EE Y+C
DS VOW
DS VOB + V MUTE
VTR SYNC
VTR SYNC
ODS (VOW)
MASK (VOB)
VD, HD ADD
ODS (CHRACTER MIX)
PB/EE Y
EE Y+C
SYNC SEP
AGC DET
CLAMP
AGC OFF
REC
PB
AGC AMP
2Vp-p
IC201 ㊳ PB
2.5Vp-p
IC201 ㉕ REC/PB
REC Y+C (LINE) . REC Y (CAM)
PB Y
IC201 ⑦ REC/P
NOISE CANSEL
ATT
LPF
PB Y
REC Y
KNEE CLIP
REC Y
PB Y
WCCD PB
REC Y (CAM)
IN-EMPHASIS
SUB-EMPHASIS
LIMITER
HPF
REC
PB
IN EMPHASIS
ME CONSTANT
HALF H SHIFT CANCEL
SWP (51)
PB Y
REC
PB
DOC SWITCH
NORMAL
DOC
REC Y+C (LINE)
REC Y+C (LINE) . PB Y
SWP (51)
NORM
YD.PB+ (VA SWP+HCP)
Y AGC DET
CORRE OFF
Y CORRE DET
REC+PB
WCCD.PB
CLAMP
TRAP 3.58MHz
CLAMP
Y AGC AMP
REC Y+C (LINE)
PB Y
PB+YD.PB+FORCED YD
REC Y (CAM)
CAM.REC+B/W.REC
REC Y (LINE)
REC
REC Y (CAM)
EQ
3.58MHz BPF
PB
REC
REC. (PAL+EDIE+NON CORR)
ATT
HPF
PB
REC
3.58MHz TRAP
REC Y (LINE)
REC C (LINE).PB C
REC Y+C (LINE).REC C (CA
CAM REC+WCCD PB
CAM REC . CORRE OFF
REC Y+C (LINE)
EDIT OFF
C+CD
1H DELAY L
0.2Vp-p
IC201 ⑬ REC
IC201 ⑬ PB
㉜ 0.28Vp-p
㊱ 1.4Vp-p
IC301 ㉜,㊱ PB
SP/LP (CN201 ㉟)
CROSS TALK
CORR
NO CORR
SP
LP
YC SEL
CORR DET
SP
LP
ATT
ATT
7.16MHz BPF
Q304
EDIT (CN201 ㉗)
REC C (CAM) . PB C
REC C (CAM)
PAD C SEL
CAM/LINE (CN201 ㉞)
PB/EE C
CHROMA MUTE
ACK SW
Q310
ACK DETECT
ACK
ACK CONT
C MUTE
ACK BF
DS VOB + V MUTE
1/8
ACK DET
378fH VCO
AFC REC ERROR
PB
AFC FILTER
AFC DET
1/378
0.3Vp-p
IC301 ㊳ PB
2.5Vp-p
IC301 ㊻ REC/PB
SYNC DET
APC DET
APC FILTER
HALF H KILLER BURST FLAG
VTR SYNC (IC201 ㉕)
FSC (90°)
FSC (0°)
3.58MHz VXO
REC ON
BF OUT
FSC
FSC
X301 3.58MHz
Q306
FREQ SWITCH
BF
JOG (CN201 ㉙)

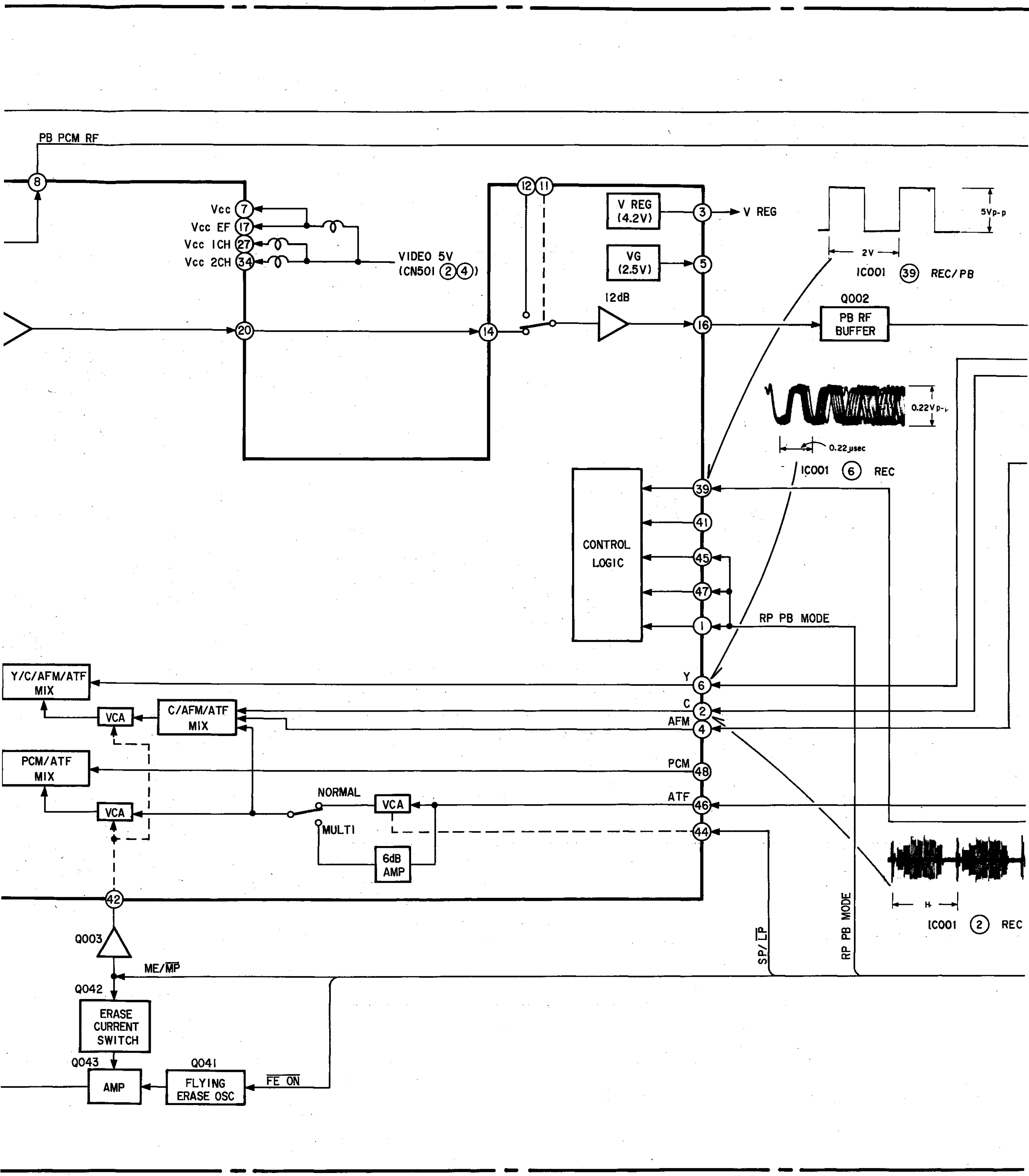


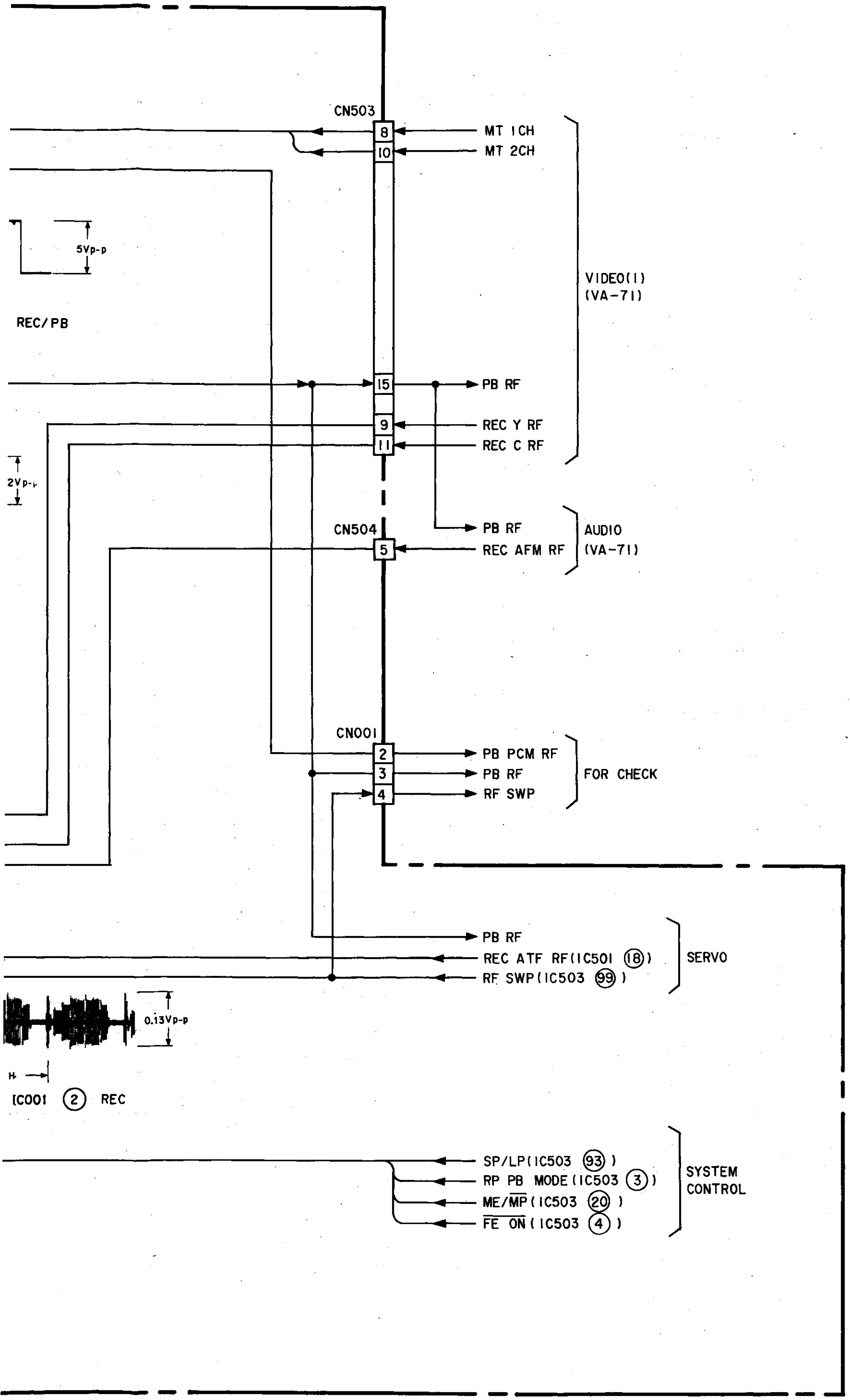
IC201 ㊳ PB
2Vp-p
H
IC201 ㊳ REC
BUS DECODER
CS
CK
SI
VIDEO CS
SCK
DATA TO SLVE
JOG VG + AFC H
IC201 ㉘,㉜ REC
0.6Vp-p
AGC OFF
REC
PB
AGC AMP
INPUT SELECT
CLAMP
CLAMP
REC Y (CAM), PB/EE Y+C
REC Y+C (LINE)
IC202 (1/2)
IN
OUT
REC Y+C (LINE)
V IN SW (CN201 ㉓)
EE LVL
Vcc
VIDEO OUT AMP
VID 4.9V (CN201 ⑲ ⑳)
Y/C MIX
PB+ CAM·REC
0.5Vp-p
IC201 ⑦ REC/PB
PB Y
V OUT SW (CN201 ⑱)
0.6Vp-p
IC201 ③ REC/PB ㉘ PB
ACK DC (COLOR/BW)
PB/REC C (CAM) + ACK DC
Q309,314,318
CAMERA REC
MUTE
PB
Q319 ACK SWITCH
ACK (Q310, IC301 ㊳)
CAM/LINE (CN201 ㉞)
V MUTE (CN201 ㉘)
Q312,313
NOISE CANSEL
ATT
LPF
LIMITER
HPF
HPF
Q235
BUFFER
REC Y
PB Y
CLAMP
REC/PB Y
WCCD PB
REC Y (CAM) . PB Y
REC Y (CAM)
EQ
Y COMB FILTER
CAM·REC+B/W·REC
REC
PB
YD·PB
REC/PB Y
3.58MHz TRAP
FL201 LPF DELAY 310nS
Q228 EQ
Q229 PEAKING AMP
Q232 BUFFER
EMPHASIS Y LEVEL ADJ
VCA
IC206 (1/2)
EMP LVL
Q225,226 TRAP ON/OFF SWITCH
Q233,227 REC/PB SWITCH
Q230 PEAKING ON/OFF SWITCH
D202
EDIT (CN201 ㉗)
VA PB MODE (CN201 ㉝)
CAM/LINE (CN201 ㉞)
WCCD·PB
LIMITER
ATT
PB
REC
3.58MHz TRAP
NO CORRE Y
ATT
REC Y (LINE)
COMB FILTER
REC··Y/C SEP
PB···CROSSTALK CANCEL
DM
REC C (LINE)·PB C
REC Y+C (LINE)·REC C (CAM)
HPF
CLAMP
C ACC AMP
C ACC DET
1H DELAY Y+C (REC)
1H DELAY C (PB)
IC051
REC
PB
CAM REC+WCCD PB
REC Y+C (LINE)
CAM REC · CORRE OFF
REC Y+C (LINE), REC C (CAM)
PB C (CAM)
Y/C MIX
DM
EDIT OFF
C+CD
LI MC
V REF (3.5V)
IR
TRAP, BPF, EQ CHARACTER
COMB
1H DELAY (CCD)
CCD CLOCK
4FSC PLL
Vdd
Vdd
Q053 AMP
Q051 LPF DELAY 180nS
Q055 EQ
Q057 BUFFER
RV051 Y/C SEP
5V
Q051,052
VIDEO 4.9V (CN201 ⑲, ⑳)
CAM/LINE (CN201 ㉞)
DL FSC (IC301 ⑫)
IR ADJ
IC205
V REG (IC201 ⑥)
SR IR
REC C (CAM), PB C
0.2Vp-p
0.22Vp-p
IC201 ⑬ PB
EC
0.7Vp-p
IC201 ⑲ REC
0.6Vp-p
IC201 ⑲ PB
0.5Vp-p
IC051 ① PB
REC C (CAM)
PB/EE C
FSC (IC301 ⑫)


Q064~066
CHRACTER MIX & CHROMA TRAP
CN202
EVF OUT
EVF (CK-47)
(See Page 119)
CS-31 BOARD (1/7)
(See Page 153)
PS-282 BOARD (1/3)
J950 EASY CONNECTOR
CN201
VIDEO OUT
RFU DC OUT
CN503
CN501
CN950
EE LVL
VK-22 BOARD(1/3)
PJ-45 BOARD (1/3)
CN550
J550(1/2)
RFU DC OUT
VIDEO OUT
VIDEO 49V (CN201 ⑲⑳)
Q990,991
CURRENT LIMITER
CN400
RFU DC OUT
VIDEO IN
VIDEO OUT
W573
W570
S551
IN
OUT
(See Page 146)
(See Page 145)
IC052
Q060
BUFFER
FL053,054
LPF
CHARACTER MIX
CHA Y
DDS VOW
DDS VOB
DDS-VOB
Y CHK
CAM C
IN/OUT SW
SYSTEM CONTROL (CS-31)
CAMERA(1) (CS-31)
Q067
EMP LVL
Q063
IC053
DS VOW
DS VOB + V MUTE
D206
D205
IOG VD + AFC H
DS VOB
AFC H
CAM FSC
VTR SYNC
DS ON
Q302(1/2)
FSC (IC301 ⑫)
BUFFER
E/L DET
V OUT SW
OUT SW
SYNC DET
AGC SLOW
V IN SW
IN SW
E MODE
JOG VD
EDIT
V MUTE
JOG
H CHG
ME/MP
VA PB MODE
CAM/LINE
SP/LP
SYSTEM CONTROL (CS-31)
IC203
EVR (D/A CONVERTER)
EELVL
SR IR
COMB
EMPLVL
CARR
DEV
REC Y
REC C
SI
SCK
D/A CS
SO
VIDEO CS
DATA TO SLVE
VIDEO D/A CS
RF CONT
ATF CONT
VTR SYNC
SERVO (CS-31)
IC204
EVR (D/A CONVERTER)
PB Y
MT 1CH
MT 2CH
RF CONT
L CH IR
L CH DEV
AU FADE
AUDIO
AUDIO FSC
V1 SWP
FSC (IC301 ⑫)
Q302(1/2)
BUFFER
MT CH
MT 1CH
MT 2CH
VIDEO(2) (CS-31)

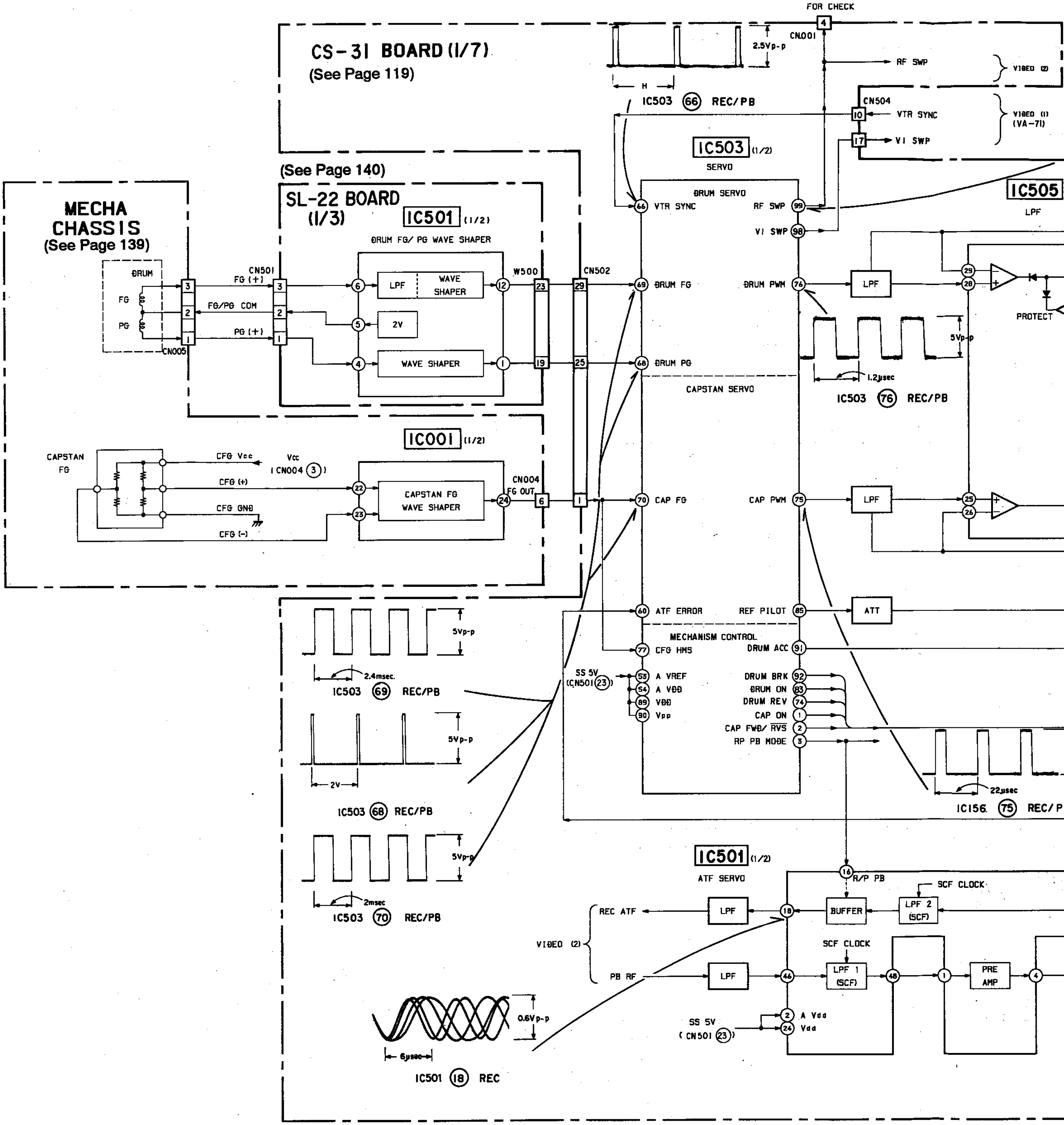
3-7. VIDEO (2) BLOCK DIAGRAM

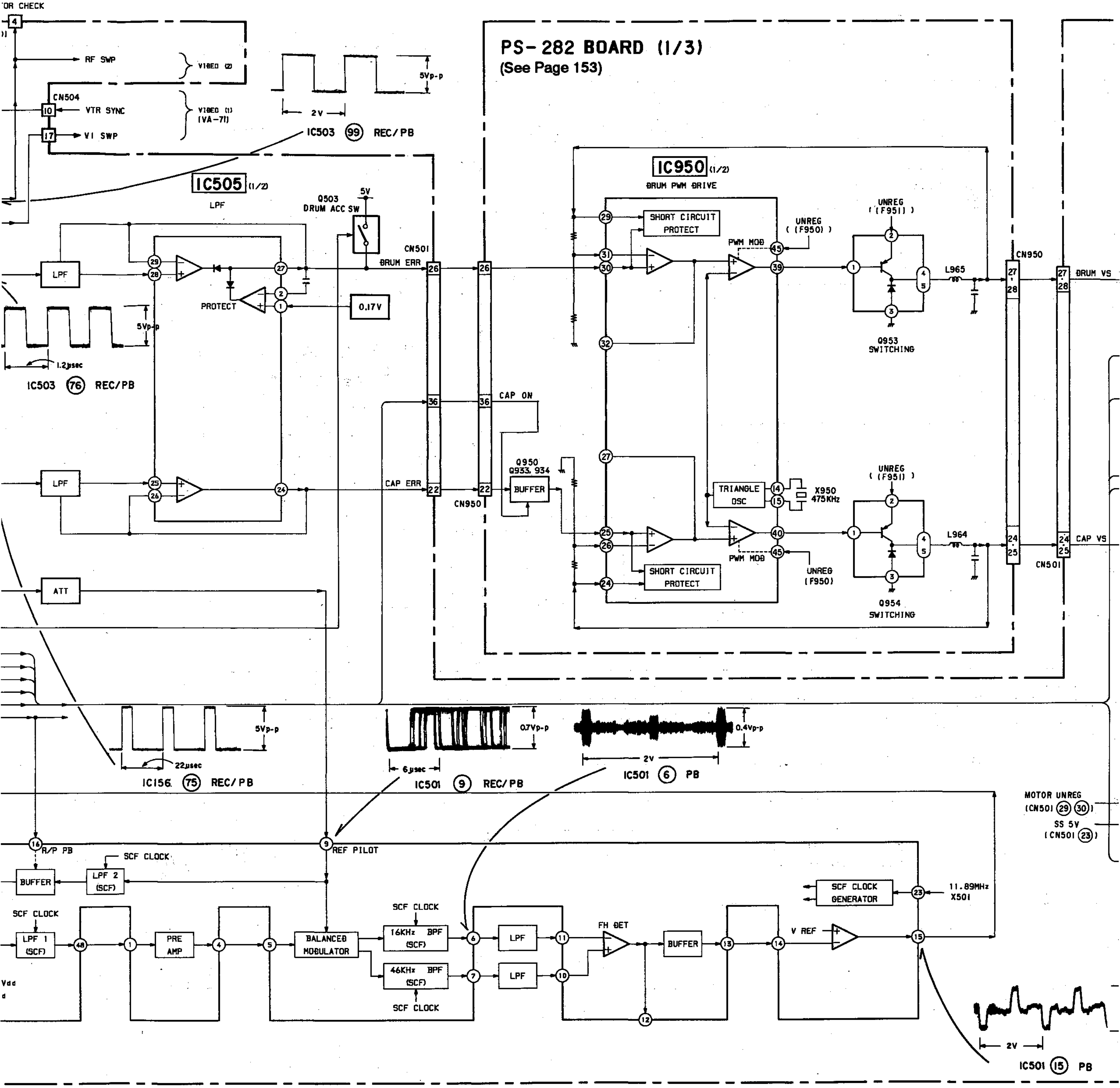

CS-31 BOARD (1/7)
(See Page 117)
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
FE(X)
12
8
2
CN002
IC001
REC/PB AMP
MT 1CH
PB PCM RF
23
8
29
CH1 HEAD AMP
CH1 EQ AMP
CH1
CH2
32
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
38
MT 2CH
Vcc
Vcc
Vcc
25
24
28
CH1 REC AMP
V
P
Y/C/AFM/ATF MIX
VCA
C/AFM/
MIX
33
CH2 REC AMP
V
P
PCM/ATF MIX
VCA
36
37
42
Q003
ME/MP
Q042
ERASE CURRENT SWITCH
Q043
AMP
Q04
FLY ERASE

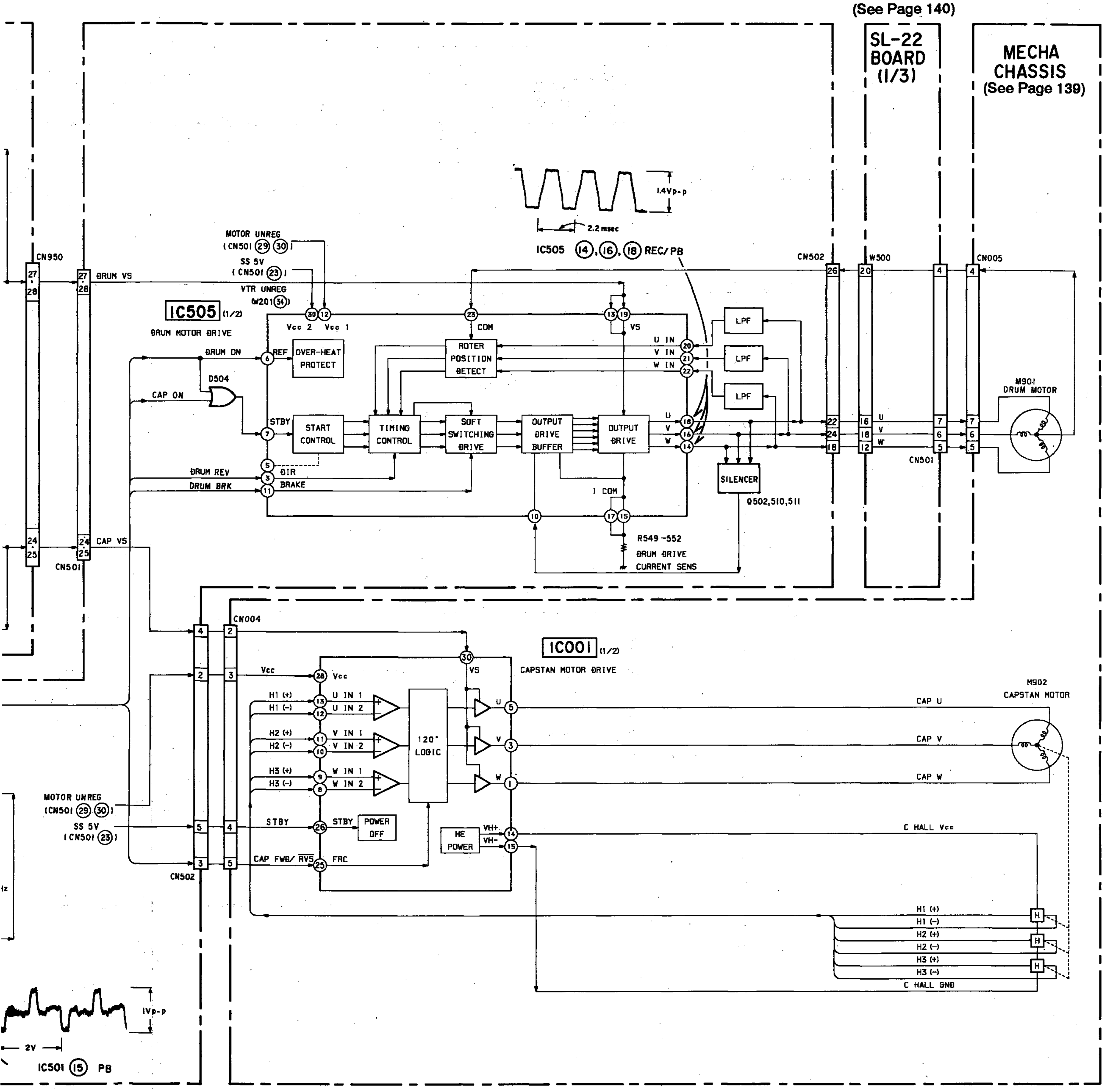

PB PCM RF
8
Vcc 7
Vcc EF 17
Vcc 1CH 27
Vcc 2CH 34
VIDEO 5V
(CN501 ② ④)
20
14
12
11
V REG
(4.2V)
3
V REG
VG
(2.5V)
5
12dB
16
Q002
PB RF
BUFFER
5Vp-p
2V
IC001 ㊴ REC/PB
0.22Vp-p
0.22µsec
IC001 ⑥ REC
CONTROL
LOGIC
39
41
45
47
1
RP PB MODE
Y
6
C
2
AFM
4
PCM
48
ATF
46
44
Y/C/AFM/ATF
MIX
VCA
C/AFM/ATF
MIX
PCM/ATF
MIX
VCA
NORMAL
VCA
MULTI
6dB
AMP
42
Q003
ME/$\overline{MP}$
Q042
ERASE
CURRENT
SWITCH
Q043
AMP
Q041
FLYING
ERASE OSC
$\overline{FE\ ON}$
SP/$\overline{LP}$
RP PB MODE
H
IC001 ② REC


CN503
8
10
MT 1CH
MT 2CH
5Vp-p
REC/PB
VIDEO(1)
(VA-71)
15
PB RF
9
REC Y RF
11
REC C RF
2Vp-p
CN504
PB RF
5
REC AFM RF
AUDIO
(VA-71)
CN001
2
PB PCM RF
3
PB RF
4
RF SWP
FOR CHECK
PB RF
REC ATF RF(IC501 ⑱)
RF SWP(IC503 (99))
SERVO
0.13Vp-p
H
IC001 ② REC
SP/LP(IC503 (93))
RP PB MODE(IC503 ③)
ME/$\overline{MP}$(IC503 ⑳)
$\overline{FE}$ ON(IC503 ④)
SYSTEM
CONTROL

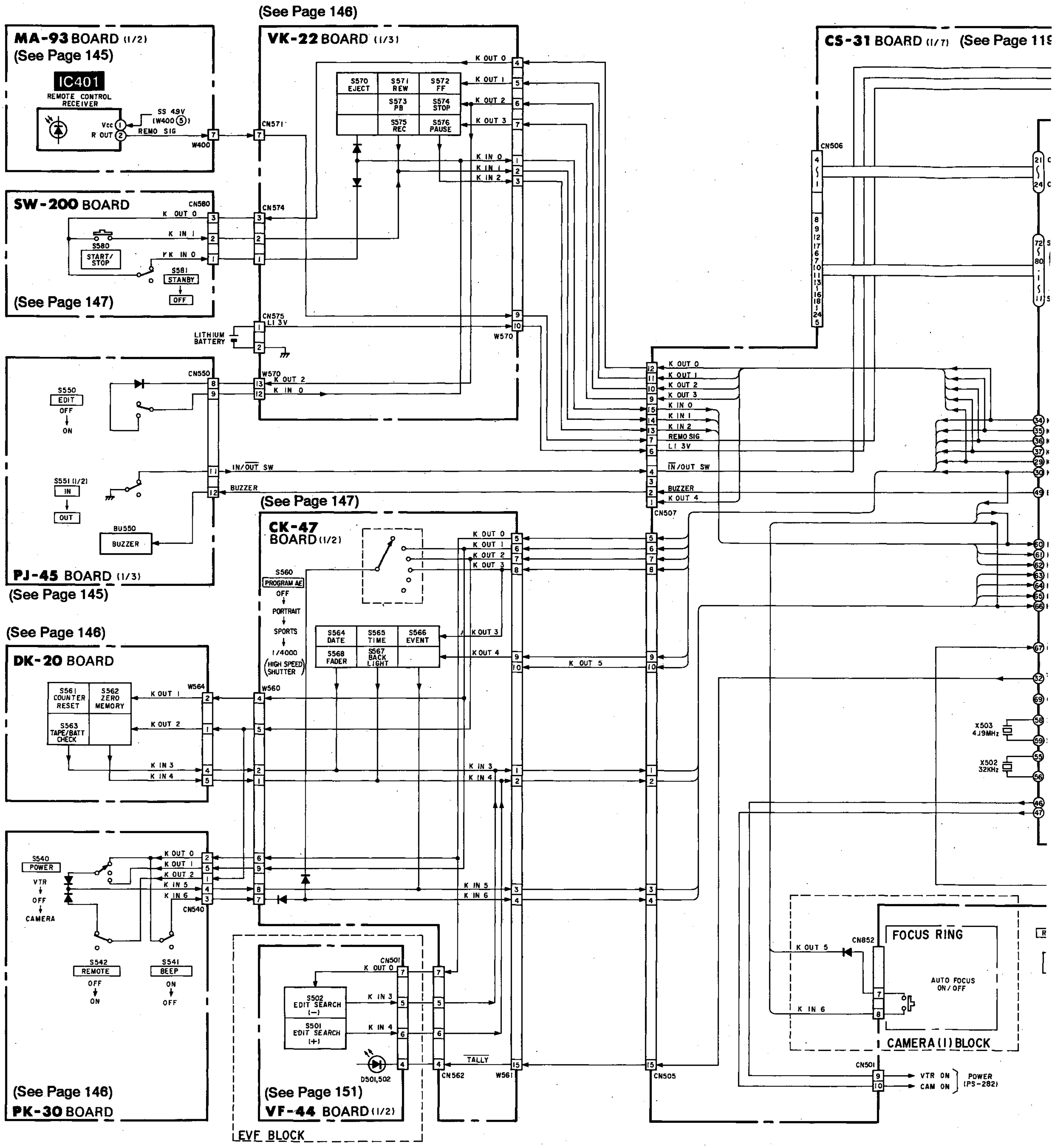
3-8. SERVO BLOCK DIAGRAM


CS-31 BOARD (1/7)
(See Page 119)
FOR CHECK
CN001
2.5Vp-p
H
IC503 66 REC/PB
RF SWP
VIDEO (2)
CN504
VTR SYNC
VIDEO (1) (VA-71)
VI SWP
IC503 (1/2)
SERVO
(See Page 140)
SL-22 BOARD (1/3)
IC501 (1/2)
DRUM FG/ PG WAVE SHAPER
MECHA CHASSIS
(See Page 139)
DRUM
FG
PG
CN005
CN501
FG (+)
FG/PG COM
PG (+)
LPF
WAVE SHAPER
2V
WAVE SHAPER
W500
CN502
DRUM SERVO
VTR SYNC
RF SWP
VI SWP
DRUM FG
DRUM PWM
DRUM PG
CAPSTAN SERVO
IC505
LPF
PROTECT
5Vp-p
1.2µsec
IC503 76 REC/PB
IC001 (1/2)
CAPSTAN FG
CFG Vcc
Vcc (CN004 3)
CFG (+)
CFG GND
CFG (-)
CAPSTAN FG WAVE SHAPER
CN004
FG OUT
CAP FG
CAP PWM
ATF ERROR
REF PILOT
ATT
MECHANISM CONTROL
CFG HMS
DRUM ACC
SS 5V (CN501 23)
A VREF
A VDD
VDD
Vpp
DRUM BRK
DRUM ON
DRUM REV
CAP ON
CAP FWD/ RVS
RP PB MODE
5Vp-p
2.4msec.
IC503 69 REC/PB
5Vp-p
2V
IC503 68 REC/PB
5Vp-p
2msec
IC503 70 REC/PB
22µsec
IC156 75 REC/P
IC501 (1/2)
ATF SERVO
R/P PB
SCF CLOCK
REC ATF
LPF
BUFFER
LPF 2 (SCF)
VIDEO (2)
SCF CLOCK
PB RF
LPF
LPF 1 (SCF)
PRE AMP
0.6Vp-p
6µsec
IC501 18 REC
SS 5V (CN501 23)
A Vdd
Vdd


OR CHECK
4
RF SWP
VIDEO (2)
CN504
10
VTR SYNC
17
VI SWP
VIDEO (1)
(VA-71)
5Vp-p
2V
IC503 (99) REC/PB
PS-282 BOARD (1/3)
(See Page 153)
IC505 (1/2)
LPF
Q503
DRUM ACC SW
5V
CN501
DRUM ERR
PROTECT
0.17V
5Vp-p
1.2μsec
IC503 (76) REC/PB
LPF
CAP ERR
CN950
CAP ON
Q950
Q933, 934
BUFFER
ATT
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT
PROTECT
UNREG
((F950))
PWM MOD
UNREG
((F951))
L965
CN950
DRUM VS
Q953
SWITCHING
TRIANGLE
OSC
X950
475KHz
UNREG
((F951))
L964
CAP VS
PWM MOD
SHORT CIRCUIT
PROTECT
UNREG
(F950)
Q954
SWITCHING
CN501
5Vp-p
22μsec
IC156 (75) REC/PB
0.7Vp-p
6μsec
IC501 (9) REC/PB
0.4Vp-p
2V
IC501 (6) PB
MOTOR UNREG
(CN501 (29) (30))
SS 5V
(CN501 (23))
R/P PB
BUFFER
SCF CLOCK
LPF 2
(SCF)
REF PILOT
SCF CLOCK
LPF 1
(SCF)
PRE
AMP
BALANCED
MODULATOR
SCF CLOCK
16KHz BPF
(SCF)
46KHz BPF
(SCF)
SCF CLOCK
LPF
LPF
FH DET
BUFFER
V REF
SCF CLOCK
GENERATOR
11.89MHz
X501
Vdd
2V
IC501 (15) PB

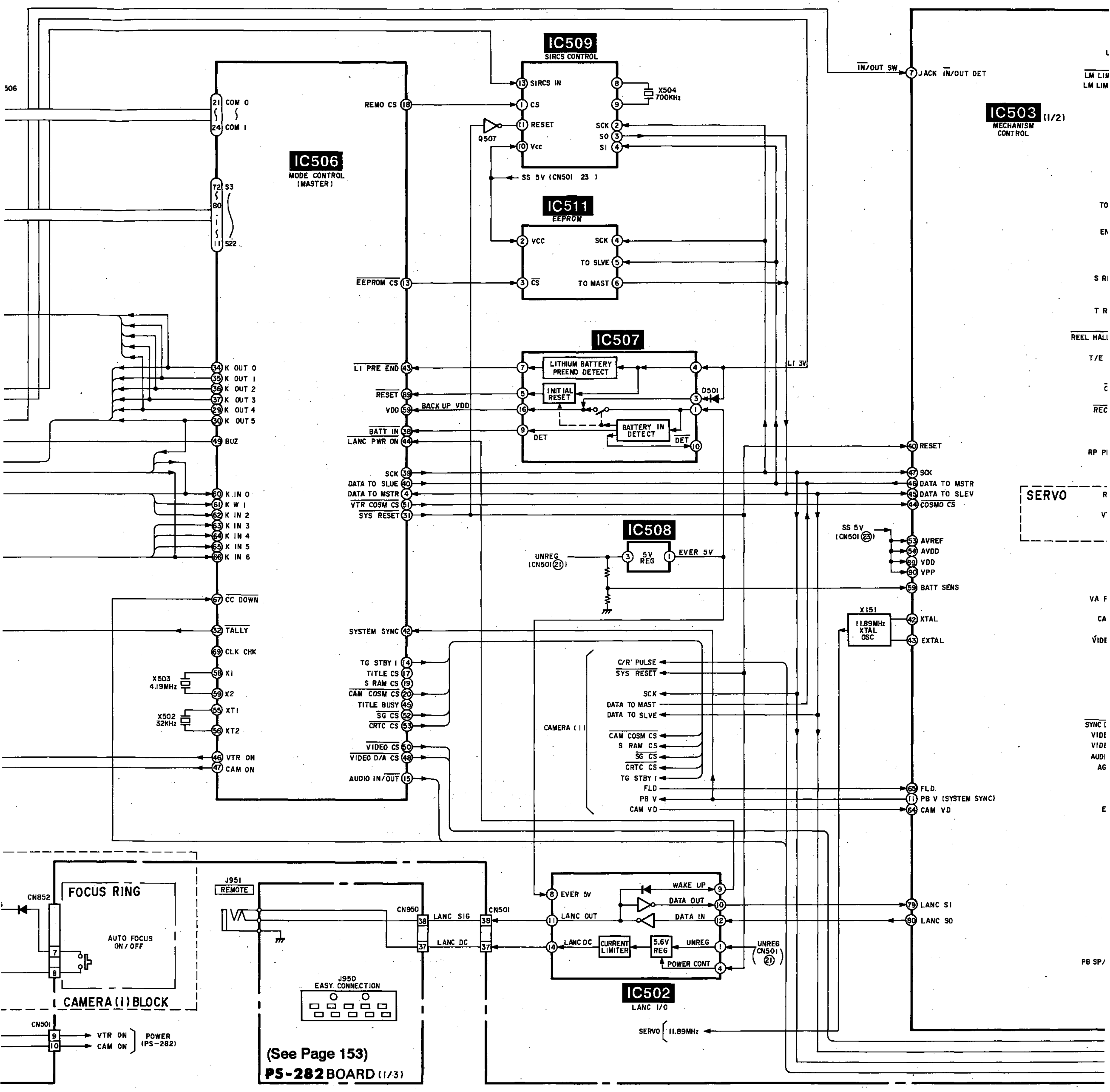

(See Page 140)
SL-22 BOARD (1/3)
MECHA CHASSIS
(See Page 139)
1.4Vp-p
2.2msec
IC505 ⑭,⑯,⑱ REC/PB
MOTOR UNREG (CN501 ㉙ ㉚)
SS 5V (CN501 ㉓)
VTR UNREG (W201 ㉞)
CN950
DRUM VS
IC505 (1/2)
DRUM MOTOR DRIVE
Vcc 2
Vcc 1
COM
VS
DRUM ON
REF
OVER-HEAT PROTECT
ROTER POSITION DETECT
U IN
V IN
W IN
LPF
D504
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
SILENCER
Q502,510,511
DRUM REV
DIR
DRUM BRK
BRAKE
I COM
R549-552
DRUM DRIVE CURRENT SENS
CN502
W500
CN005
CN501
M901 DRUM MOTOR
CAP VS
CN004
IC001 (1/2)
CAPSTAN MOTOR DRIVE
Vcc
VS
H1 (+)
H1 (-)
U IN 1
U IN 2
H2 (+)
H2 (-)
V IN 1
V IN 2
H3 (+)
H3 (-)
W IN 1
W IN 2
120° LOGIC
STBY
POWER OFF
HE POWER
VH+
VH-
CAP FWD/ RVS
FRC
M902 CAPSTAN MOTOR
CAP U
CAP V
CAP W
C HALL Vcc
C HALL GND
H
MOTOR UNREG (CN501 ㉙ ㉚)
SS 5V (CN501 ㉓)
1Vp-p
2V
IC501 ⑮ PB

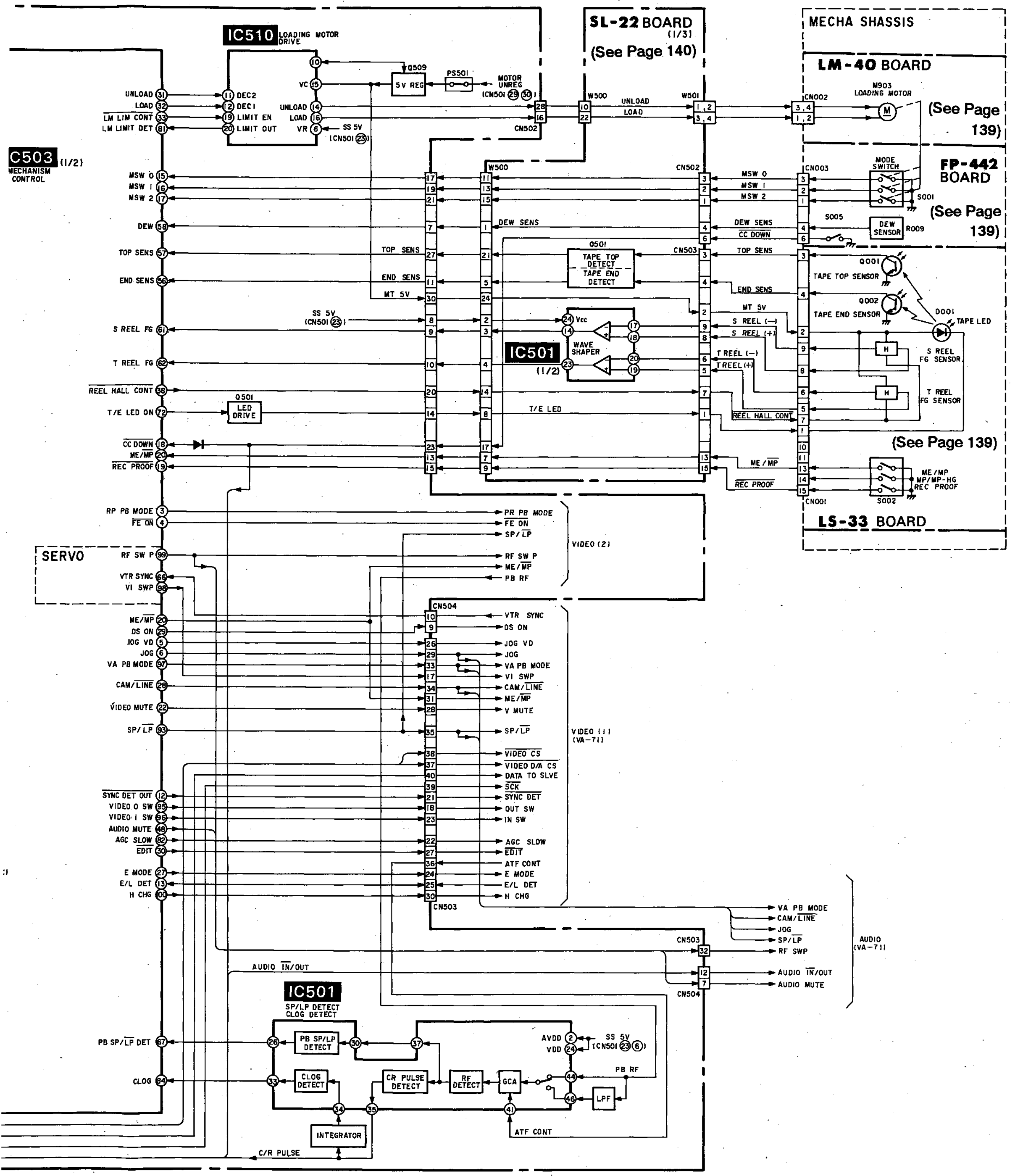
3-9. SYSTEM CONTROL BLOCK DIAGRAM



MA-93 BOARD (1/2)
(See Page 145)
IC401
REMOTE CONTROL RECEIVER
Vcc
R OUT
SS 4.9V (W400 ⑤)
REMO SIG
W400
(See Page 146)
VK-22 BOARD (1/3)
S570 EJECT
S571 REW
S572 FF
S573 PB
S574 STOP
S575 REC
S576 PAUSE
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K IN 0
K IN 1
K IN 2
CN571
CN574
CN575
LI 3V
LITHIUM BATTERY
W570
SW-200 BOARD
CN580
S580 START/STOP
S581 STANBY OFF
(See Page 147)
CS-31 BOARD (1/7) (See Page 11
CN506
CN507
REMO SIG
IN/OUT SW
BUZZER
K OUT 4
CN550
S550 EDIT OFF ON
S551 (1/2) IN OUT
BU550 BUZZER
PJ-45 BOARD (1/3)
(See Page 145)
(See Page 147)
CK-47 BOARD (1/2)
S560 PROGRAM AE OFF PORTRAIT SPORTS 1/4000 (HIGH SPEED) SHUTTER
S564 DATE
S565 TIME
S566 EVENT
S568 FADER
S567 BACK LIGHT
K OUT 5
K IN 3
K IN 4
K IN 5
K IN 6
W560
(See Page 146)
DK-20 BOARD
S561 COUNTER RESET
S562 ZERO MEMORY
S563 TAPE/BATT CHECK
W564
S540 POWER VTR OFF CAMERA
S542 REMOTE OFF ON
S541 BEEP ON OFF
CN540
(See Page 146)
PK-30 BOARD
CN501
S502 EDIT SEARCH (−)
S501 EDIT SEARCH (+)
D501,502
TALLY
CN562
W561
CN505
(See Page 151)
VF-44 BOARD (1/2)
EVF BLOCK
X503 4.19MHz
X502 32KHz
FOCUS RING
AUTO FOCUS ON/OFF
CN852
CAMERA (1) BLOCK
VTR ON
CAM ON
POWER (PS-282)

:S-31 BOARD (1/7) (See Page 119)


IC509
SIRCS CONTROL
SIRCS IN
CS
RESET
Vcc
SCK
SO
SI
X504
700KHz
Q507
SS 5V (CN501 23)
IC511
EEPROM
VCC
SCK
TO SLVE
TO MAST
CS
IC506
MODE CONTROL (MASTER)
COM 0
COM 1
S3
S22
REMO CS
EEPROM CS
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
BUZ
K IN 0
K W I
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
CC DOWN
TALLY
CLK CHK
X503
4.19MHz
X1
X2
X502
32KHz
XT1
XT2
VTR ON
CAM ON
LI PRE END
RESET
VDD
BACK UP VDD
BATT IN
LANC PWR ON
SCK
DATA TO SLVE
DATA TO MSTR
VTR COSM CS
SYS RESET
SYSTEM SYNC
TG STBY I
TITLE CS
S RAM CS
CAM COSM CS
TITLE BUSY
SG CS
CRTC CS
VIDEO CS
VIDEO D/A CS
AUDIO IN/OUT
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
DET
D501
LI 3V
IC508
5V REG
UNREG (CN501 ㉑)
EVER 5V
CAMERA (1)
C/R' PULSE
SYS RESET
SCK
DATA TO MAST
DATA TO SLVE
CAM COSM CS
S RAM CS
SG CS
CRTC CS
TG STBY I
FLD
PB V
CAM VD
IN/OUT SW
JACK IN/OUT DET
IC503 (1/2)
MECHANISM CONTROL
RESET
SCK
DATA TO MSTR
DATA TO SLEV
COSMO CS
SS 5V (CN501 ㉓)
AVREF
AVDD
VDD
VPP
BATT SENS
X151
11.89MHz XTAL OSC
XTAL
EXTAL
FLD
PB V (SYSTEM SYNC)
CAM VD
LANC SI
LANC SO
SERVO
SERVO 11.89MHz
IC502
LANC I/O
EVER 5V
WAKE UP
DATA OUT
DATA IN
LANC OUT
LANC DC
CURRENT LIMITER
5.6V REG
UNREG
POWER CONT
UNREG (CN501 ㉑)
CN950
CN501
LANC SIG
LANC DC
J951
REMOTE
J950
EASY CONNECTION
(See Page 153)
PS-282 BOARD (1/3)
FOCUS RING
AUTO FOCUS ON/OFF
CN852
CAMERA (1) BLOCK
CN501
VTR ON
CAM ON
POWER (PS-282)
LM LIM
LM LIM
REEL HALL
T/E
REC
RP PI
SYNC
VIDE
AUDI
AG
PB SP/


IC510 LOADING MOTOR DRIVE
DEC2
DEC1
LIMIT EN
LIMIT OUT
VC
UNLOAD
LOAD
VR
Q509
5V REG
PS501
MOTOR UNREG (CN501 29 30)
SS 5V (CN501 23)
CN502
UNLOAD
LOAD
LM LIM CONT
LM LIMIT DET
IC503 (1/2) MECHANISM CONTROL
MSW 0
MSW 1
MSW 2
DEW
TOP SENS
END SENS
S REEL FG
T REEL FG
REEL HALL CONT
T/E LED ON
CC DOWN
ME/MP
REC PROOF
SL-22 BOARD (1/3)
(See Page 140)
W500
W501
MT 5V
SS 5V (CN501 23)
Q501 LED DRIVE
DEW SENS
Q501
TAPE TOP DETECT
TAPE END DETECT
IC501 (1/2)
WAVE SHAPER
Vcc
T/E LED
CN503
S REEL (−)
S REEL (+)
T REEL (−)
T REEL (+)
CC DOWN
MECHA SHASSIS
LM-40 BOARD
M903 LOADING MOTOR
CN002
(See Page 139)
FP-442 BOARD
MODE SWITCH
S001
S005
DEW SENSOR
R009
CN003
(See Page 139)
Q001 TAPE TOP SENSOR
Q002 TAPE END SENSOR
D001 TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
H
(See Page 139)
ME/MP MP/MP-HG REC PROOF
S002
CN001
LS-33 BOARD
RP PB MODE
FE ON
SERVO
RF SW P
VTR SYNC
VI SWP
PR PB MODE
FE ON
SP/LP
RF SW P
ME/MP
PB RF
VIDEO (2)
CN504
ME/MP
DS ON
JOG VD
JOG
VA PB MODE
CAM/LINE
VIDEO MUTE
SP/LP
VTR SYNC
DS ON
JOG VD
JOG
VA PB MODE
VI SWP
CAM/LINE
ME/MP
V MUTE
SP/LP
VIDEO (1) (VA-71)
VIDEO CS
VIDEO D/A CS
DATA TO SLVE
SCK
SYNC DET
OUT SW
IN SW
SYNC DET OUT
VIDEO 0 SW
VIDEO 1 SW
AUDIO MUTE
AGC SLOW
EDIT
AGC SLOW
EDIT
ATF CONT
E MODE
E/L DET
H CHG
E MODE
E/L DET
H CHG
CN503
VA PB MODE
CAM/LINE
JOG
SP/LP
RF SWP
AUDIO IN/OUT
AUDIO MUTE
AUDIO (VA-71)
CN503
CN504
AUDIO IN/OUT
IC501 SP/LP DETECT CLOG DETECT
PB SP/LP DETECT
CLOG DETECT
CR PULSE DETECT
RF DETECT
GCA
LPF
AVDD
VDD
SS 5V (CN501 23 6)
PB RF
INTEGRATOR
ATF CONT
C/R PULSE
PB SP/LP DET
CLOG

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-31 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
2	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-31 board) and ATF servo IC (IC501 on CS-31 board). "H": PB.
4	PB2/PP010	$\overline{\text{FE ON}}$	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
7	PC7/RT07	JACK $\overline{\text{IN}}$/OUT	I	VA	Jack in/out switch input. "L" when input.
8	PC6/RT06	1.7M DET	I	VA	Not used.
9	PC5/RT05	JACK $\overline{\text{MONO}}$/STE DET	I	VA	
10	PC4/RT04	INT VD	I		
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O	VA	Sync detect output. "L" when Sync is detected.
13	PC1/RT017	E/$\overline{\text{L}}$ DET	I	VA	Not used.
14	PC0/RT016	MIC $\overline{\text{MONO}}$/ST DET	I	AU	
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	
18	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. "L": down.
19	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. "L" when REC prohibit.
20	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. "L": MP, "H": ME.
21	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.
23	PD7	LINE MIX	I	VA	Not used.
24	PD6	MAT SEL 1	I	VA	
25	PD5	MAT SEL 2	I	VA	
26	PD4	MAT ON/$\overline{\text{OFF}}$	O	VA	
27	PD3	E MODE	O	VA	
28	PD2	CAM/$\overline{\text{LINE}}$	O	VA	Camera input/line input select signal. "H" when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.
30	PD0	$\overline{\text{EDIT}}$	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.
33	PH5	$\overline{\text{LM LIM COM}}$	O	SS	Loading motor limiter control signal. Temporary "H" when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".
36	PH2		O		N.C.
37	PH1		O		
38	PH0	$\overline{\text{REEL HALL CONT}}$	O	SS	Reel FG sensor (HALL element) power supply control signal.
39	MP	MP			Connected to GND.
40	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.89 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-31 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

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Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by PB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 33.3 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 2.8 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 994 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

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Pin No.	Port Name	Signal	I/O	Connection	Function
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04		O		N.C.
95	PA3/PP03	VIDEO O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	VIDEO I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 30 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 30 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-31 BOARD: μPD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-31 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-31 board). Normally "L".
15	S26/BP2	AUDIO IN/$\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-31 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-31 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input Power source for LCD dirve. Not used.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H"
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 μS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-31 board).

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Pin No.	Port Name	Signal	I/O	Connection	Function
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-71 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-71 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-31 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-31 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-31 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	Cassette compartment lock switch input. "L": Lock.
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	System reset input. "L": Reset, Normally: "H".
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		N.C.
69	S0	CLK CHK	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
70	S1	S1	O		
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-31 BOARD)

NAME	I/O	No.	VTR MODE												
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	X2	SHUT
						CUE	REVIEW		CUE	REVIEW					FW
SP/$\overline{\text{LP}}$	O	IC503 (93)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2
VA PB MODE	O	IC503 (97)	L	L	L	H	H	H	H	H	H	H	H	H	H
AUDIO MUTE *13	O	IC503 ㊽	L	L	L	H	H	L	H	H	H	H	H	L	H
VIDEO MUTE	O	IC503 ㉒	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*1
CAM/$\overline{\text{LINE}}$	O	IC503 ㉘	L	L	L	L	L	L	L	L	L	L	L	L	L
JOG VD	O	IC503 ⑤	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{FE ON}}$	O	IC503 ④	H	H	H	H	H	H	H	H	H	H	H	H	H
RF SWP	O	IC503 (99)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ⑥	L	L	L	H	H	L	H	H	H	H	H	H	H
$\overline{\text{VIDEO CS}}$	O	IC506 ㊿	V period "L" pulse												
$\overline{\text{VIDEO D/A CS}}$	O	IC506 ㊽	V period 'H" pulse												
DATA TO MSTR	I	IC506 ㊶	V period "L" pulse												
DATA TO SLVE	O	IC506 ㊵	V period pulse train												
SCK	I	IC506 ㊴	V period "H" pulse												
PB SP/$\overline{\text{LP}}$ DET	I	IC503 (67)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L
CLOG	I	IC503 (84)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*1
VTR SYNC	I	IC503 (66)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*1

*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.
*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*3. Edit search button pressed when playback pause mode.
*5. False VD signal
*7. 30 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area or drop
*12. Composite sync signal input se
video signal. (polarity +)
*13. "H" during camera mode load/u
*14. "L" when external input (video
*15. "H" when tape no signal. "L" w

	VTR MODE										CAMERA MODE					
	PICTURE SEARCH		PB-PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
	CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
	*2	*2	*1	*1	*1	*1	*2	*2	H	H	H	H	*2	*2	H	H
	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
5	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
	V period "L" pulse															
	V period 'H" pulse															
	V period "L" pulse															
	V period pulse train															
	V period "H" pulse															
	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
1	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
2	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*11. "H": no recording area or drop out area on tape. Head clog detection input.

*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)

*13. "H" during camera mode load/unload.

*14. "L" when external input (video) present. "H" when other cases.

*15. "H" when tape no signal. "L" when other cases.

3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE												
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	X2	SHUTTLE E
						CUE	REVIEW		CUE	REVIEW					FWD
T.REEL FG	I	IC503 (62)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
S.REEL FG	I	IC503 (61)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
ATF ERROR	I	IC503 (60)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503 (68)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503 (69)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503 (70), (77)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503 ①	L	H	H	H	H	H	H	H	L	*8	*8	H	H
REF PILOT	O	IC503 (85)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC503 ㉟	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC503 ②	L	H	L	H	L	H	H	L	L	*8	*8	H	H
DRUM PWM	O	IC503 (76)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503 (75)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC503 ㉝	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC503 (83)	L	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC503 (91)	L	L	L	L	L	L	L	L	L	L	*8	L	L
DRUM BRK	O	IC503 (92)	L	L	L	L	L	L	L	L	L	L	*8	L	L

*1. Inputting waveform which is similar to sine wave according to reel rotation.

*2. ATF error voltage input

*3. One PG pulse input per one drum rotation, approx. 30 Hz.

*4. 12 FG pulses input per one drum rotation, approx. 360 Hz.

*5. 520 FG pulses input per one capstan rotation. Approx. 994 Hz when REC/PB (SP). 498 Hz when PB (LP).

*6. Four frequencies output synchronized with drum rotation. f1=102.54 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz

*7. f2 (118.95 kHz) output

*8. "H" pulse when tape run.

*9. 21.5 μsec period PWM signal

*10. Normally "H". Temporary "L" when

*11. Temporary "H" when cassette loadin

*12. "H": approx. 1.3 Vdc

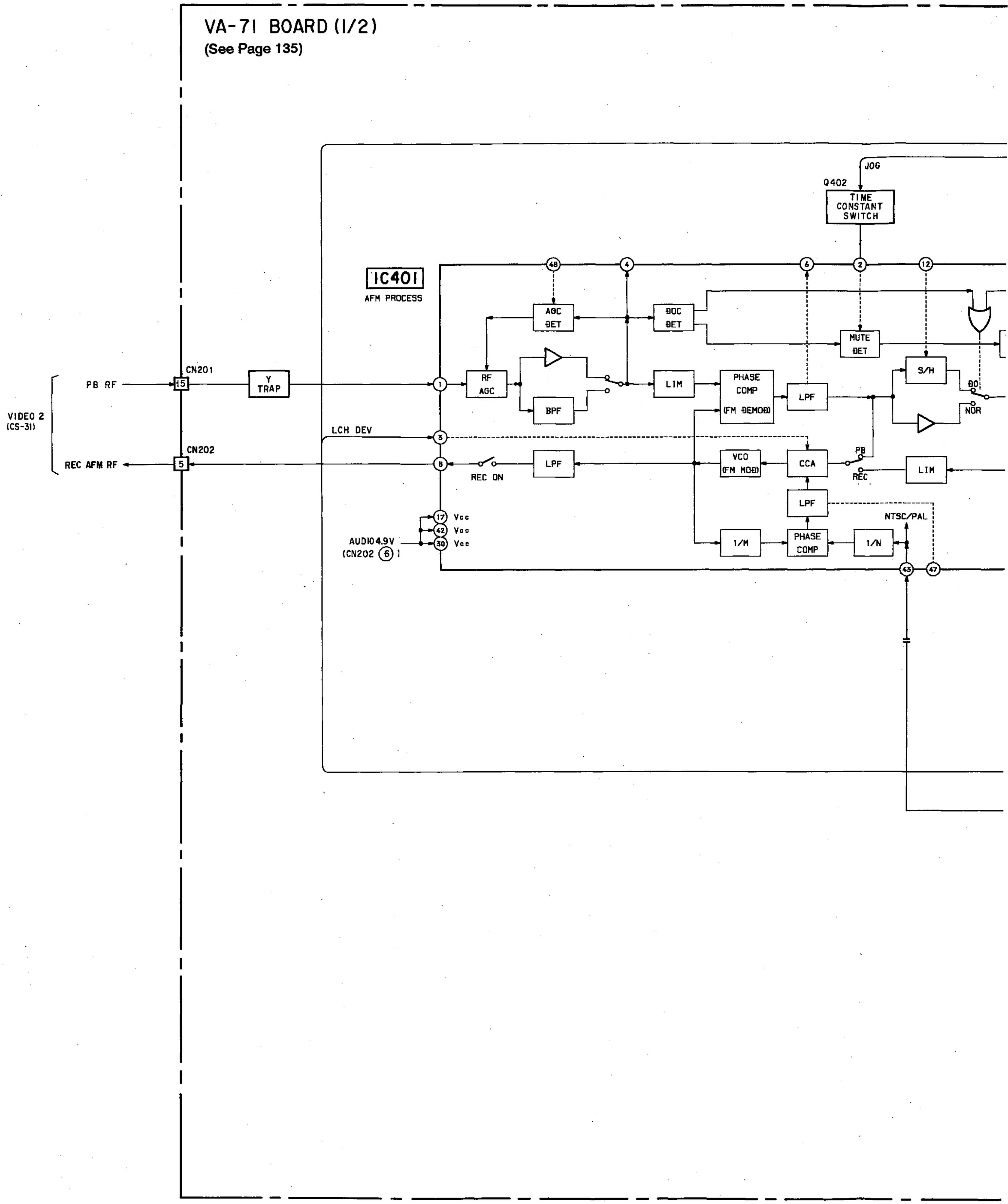
*13. Edit search button pressed when play

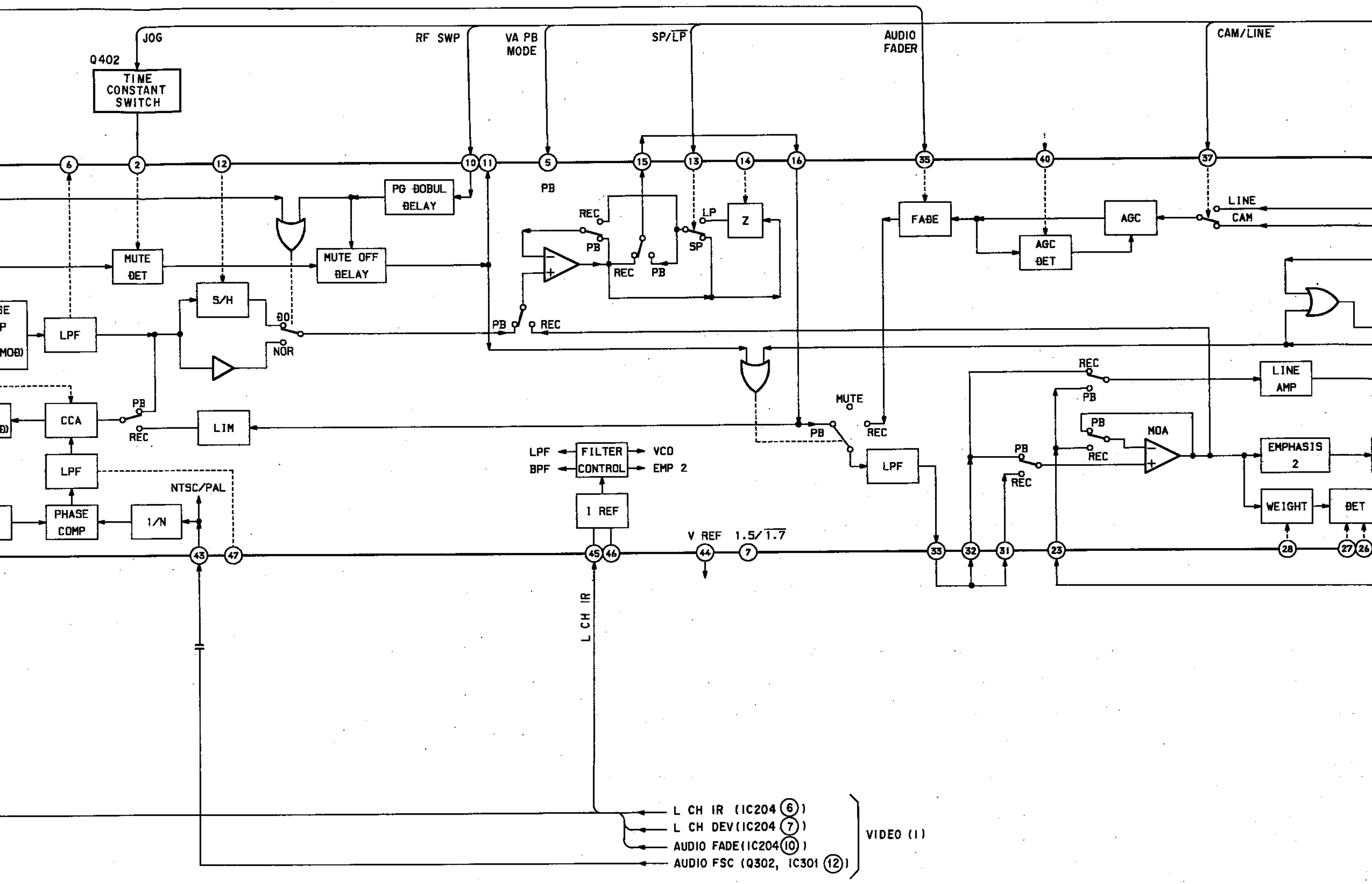
	VTR MODE										CAMERA MODE					
B	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
	CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

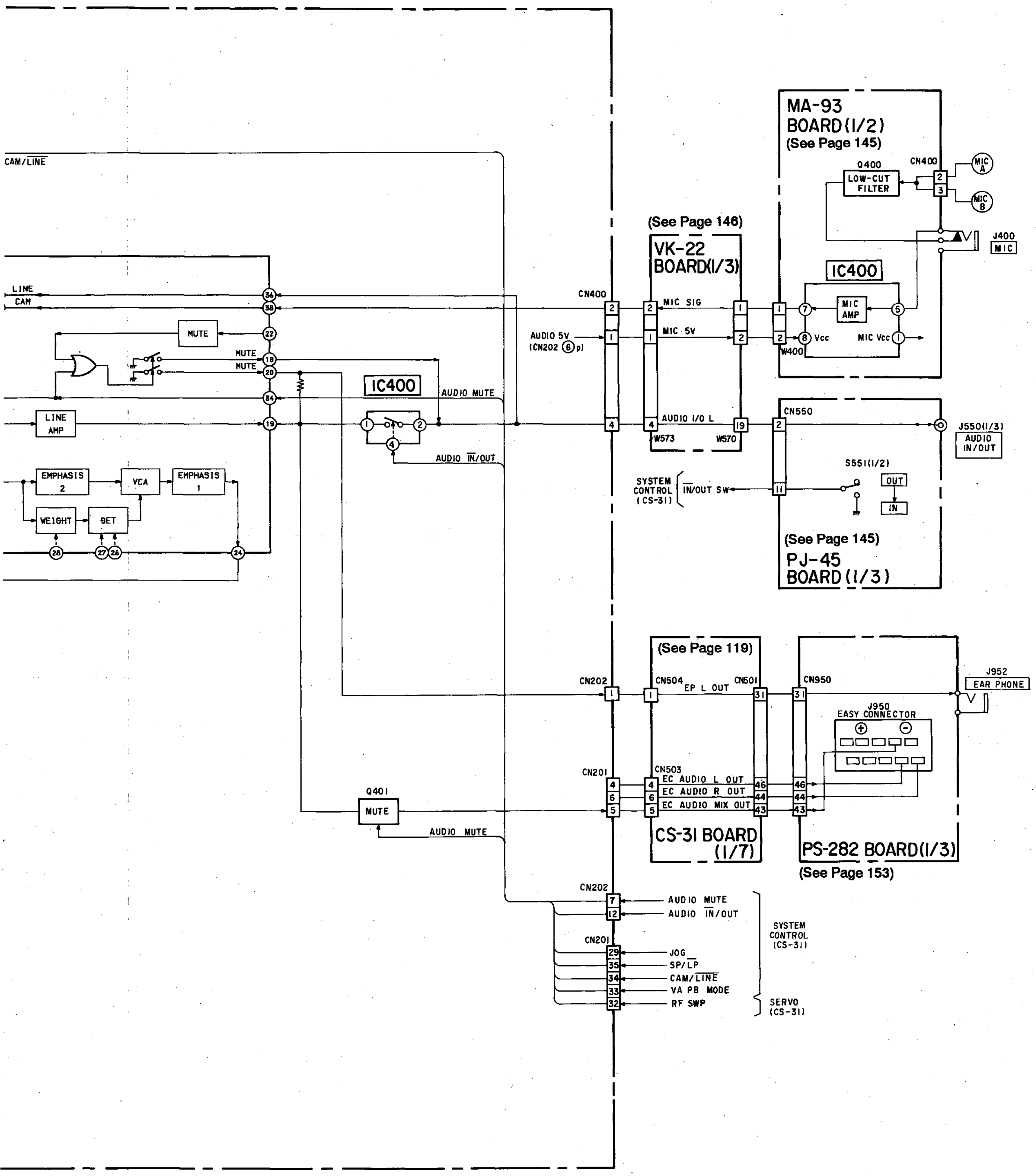
*7. f2 (118.95 kHz) output
*8. "H" pulse when tape run.
*9. 21.5 μsec period PWM signal
*10. Normally "H". Temporary "L" when load (drum reverse rotation).
*11. Temporary "H" when cassette loading (finger catch protection).
*12. "H": approx. 1.3 Vdc
*13. Edit search button pressed when playback pause mode.

kHz,

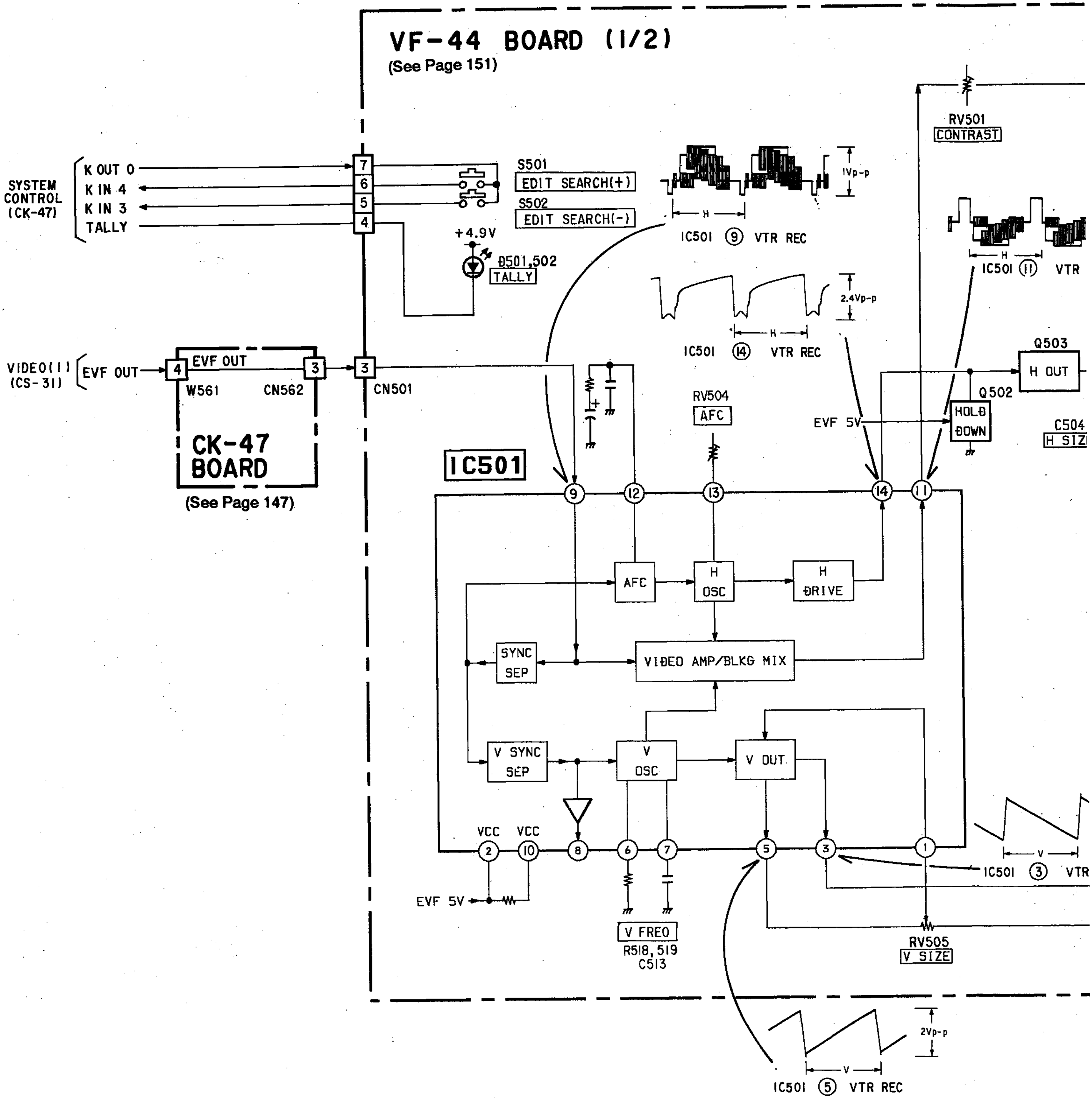
3-13. AUDIO BLOCK DIAGRAM

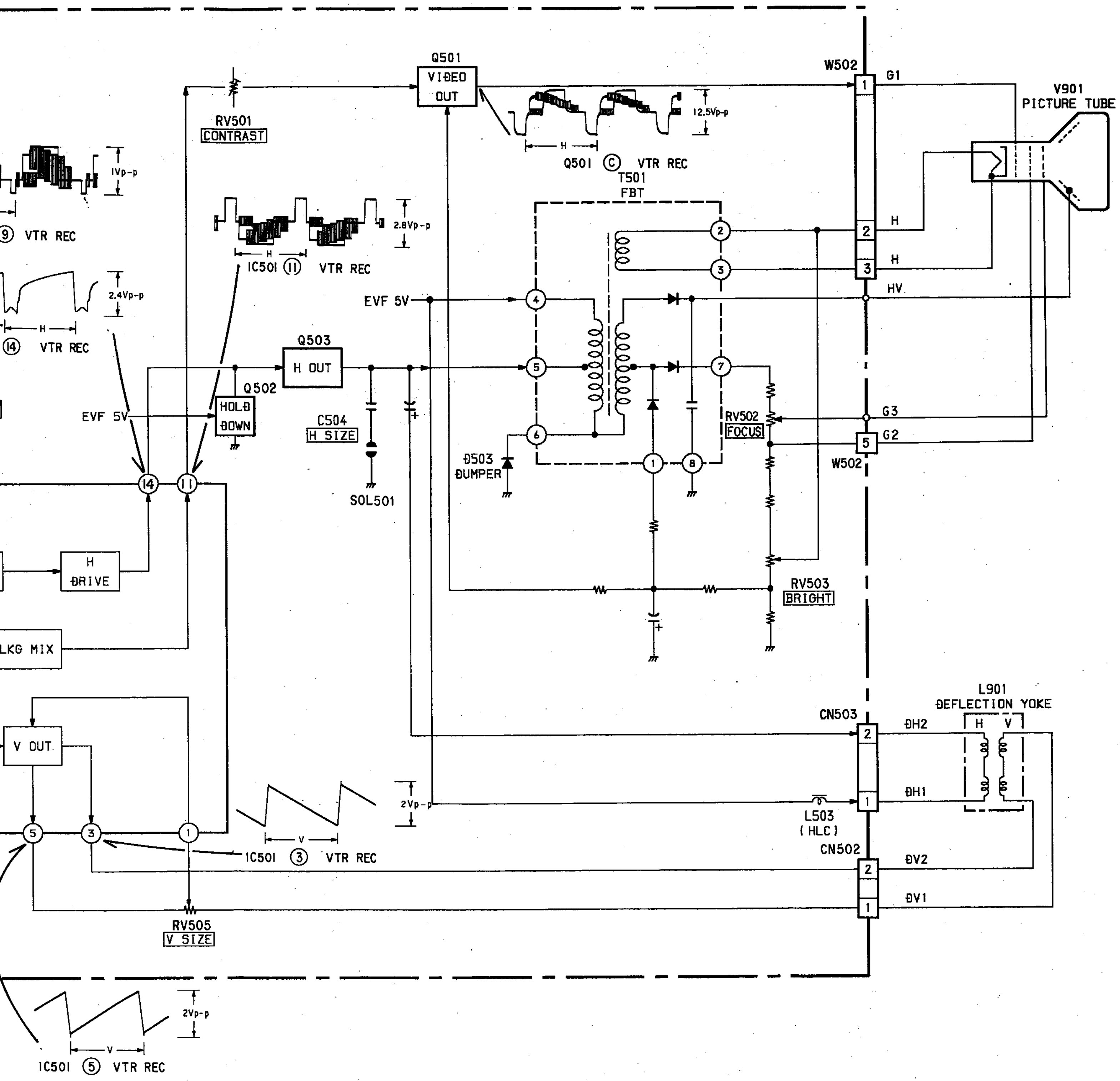

VA-71 BOARD (1/2)
(See Page 135)
IC401
AFM PROCESS
Q402
TIME CONSTANT SWITCH
JOG
48
4
6
2
12
AGC DET
DOC DET
MUTE DET
RF AGC
BPF
LIM
PHASE COMP (FM DEMOD)
LPF
S/H
DO
NOR
VIDEO 2 (CS-31)
PB RF
CN201
15
Y TRAP
1
LCH DEV
3
REC AFM RF
CN202
5
8
REC ON
LPF
VCO (FM MOD)
CCA
PB
REC
LIM
LPF
1/M
PHASE COMP
1/N
NTSC/PAL
17 Vcc
42 Vcc
30 Vcc
AUDIO4.9V
(CN202 ⑥)
43
47


JOG
Q402
TIME CONSTANT SWITCH
RF SWP
VA PB MODE
SP/$\overline{LP}$
AUDIO FADER
CAM/$\overline{LINE}$
PG DOBUL DELAY
MUTE DET
MUTE OFF DELAY
S/H
DO
NOR
LPF
CCA
PB
REC
LIM
LPF
PHASE COMP
1/N
NTSC/PAL
PB
REC
PB
REC
PB
SP
LP
Z
PB
REC
FILTER CONTROL
LPF
BPF
VCO
EMP 2
I REF
V REF
1.5/$\overline{1.7}$
MUTE
PB
REC
LPF
FADE
AGC DET
AGC
LINE
CAM
REC
PB
LINE AMP
PB
REC
PB
REC
MOA
EMPHASIS 2
WEIGHT
DET
L CH IR
L CH IR (IC204 ⑥)
L CH DEV(IC204 ⑦)
AUDIO FADE(IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)
⑥ ② ⑫ ⑩ ⑪ ⑤ ⑮ ⑬ ⑭ ⑯ ㉟ ㊵ ㊲
㊸ ㊼ ㊺ ㊻ ㊹ ⑦ ㉝ ㉜ ㉛ ㉓ ㉘ ㉗ ㉖


CAM/LINE
LINE
CAM
MUTE
MUTE
MUTE
36
38
22
18
20
34
19
LINE AMP
IC400
AUDIO MUTE
AUDIO IN/OUT
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
28
27
26
24
(See Page 146)
VK-22 BOARD(1/3)
CN400
MIC SIG
MIC 5V
AUDIO 5V (CN202 ⑥p)
AUDIO I/O L
W573
W570
MA-93 BOARD(1/2) (See Page 145)
Q400
LOW-CUT FILTER
CN400
MIC A
MIC B
J400 MIC
IC400
MIC AMP
Vcc
MIC Vcc
W400
CN550
J550(1/3) AUDIO IN/OUT
S551(1/2)
OUT
IN
SYSTEM CONTROL (CS-31)
IN/OUT SW
(See Page 145)
PJ-45 BOARD (1/3)
(See Page 119)
CN202
CN504
EP L OUT
CN501
CN950
J952 EAR PHONE
J950 EASY CONNECTOR
CN201
CN503
EC AUDIO L OUT
EC AUDIO R OUT
EC AUDIO MIX OUT
Q401
MUTE
AUDIO MUTE
CS-31 BOARD (1/7)
PS-282 BOARD(1/3)
(See Page 153)
CN202
AUDIO MUTE
AUDIO IN/OUT
SYSTEM CONTROL (CS-31)
CN201
JOG
SP/LP
CAM/LINE
VA PB MODE
RF SWP
SERVO (CS-31)

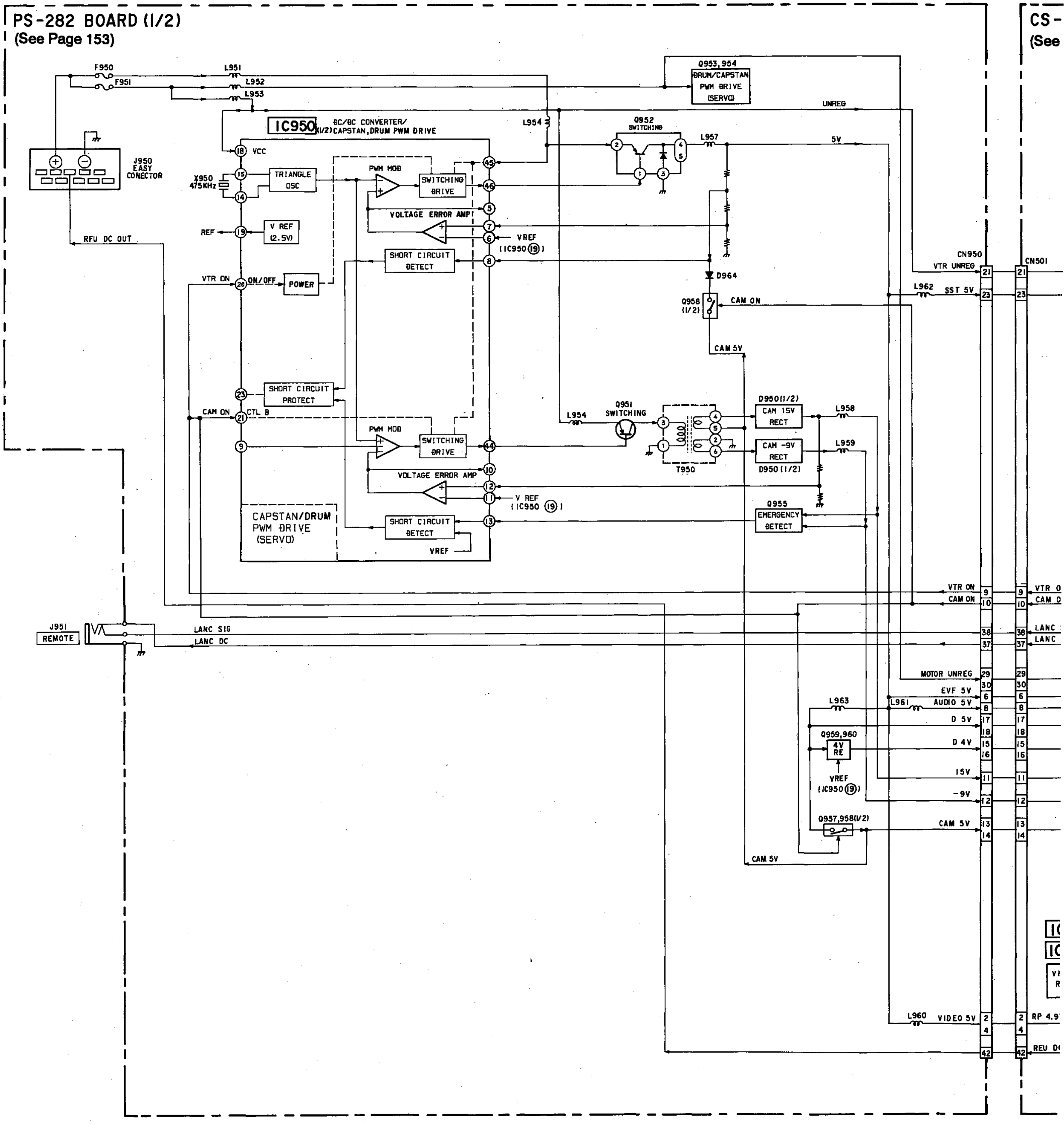
3-14. EVF BLOCK DIAGRAM

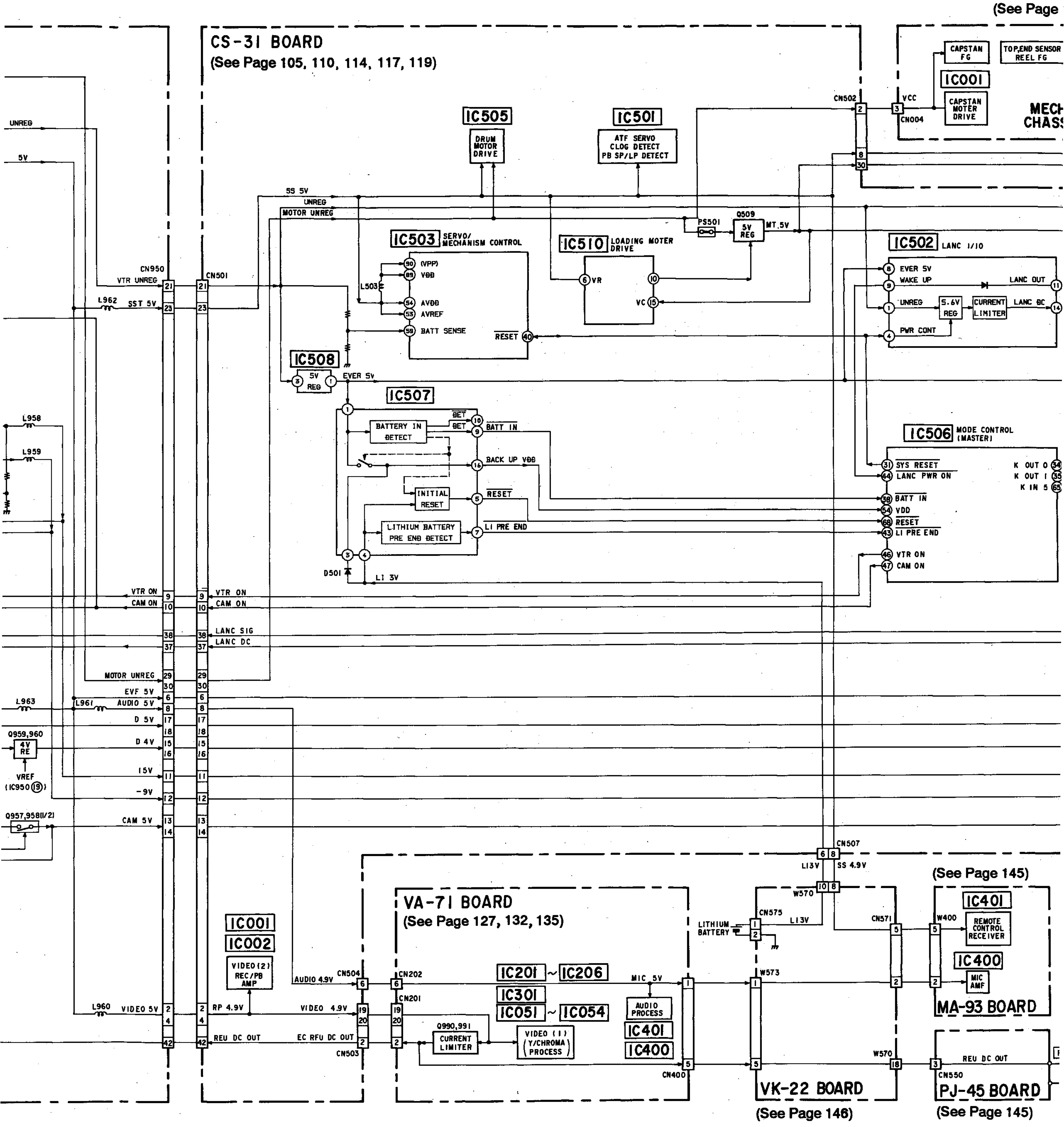

VF-44 BOARD (1/2)
(See Page 151)
SYSTEM CONTROL (CK-47)
K OUT 0
K IN 4
K IN 3
TALLY
7
6
5
4
S501
EDIT SEARCH(+)
S502
EDIT SEARCH(-)
+4.9V
D501,502
TALLY
1Vp-p
H
IC501 ⑨ VTR REC
2.4Vp-p
H
IC501 ⑭ VTR REC
RV501
CONTRAST
H
IC501 ⑪ VTR
Q503
H OUT
Q502
HOLD DOWN
EVF 5V
C504
H SIZ
VIDEO(1) (CS-31)
EVF OUT
4
EVF OUT
3
W561
CN562
CK-47 BOARD
(See Page 147)
3
CN501
RV504
AFC
IC501
⑨
⑫
⑬
⑭
⑪
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
②
⑩
⑧
⑥
⑦
⑤
③
①
EVF 5V
V FREQ
R518, 519
C513
RV505
V SIZE
V
IC501 ③ VTR
2Vp-p
V
IC501 ⑤ VTR REC



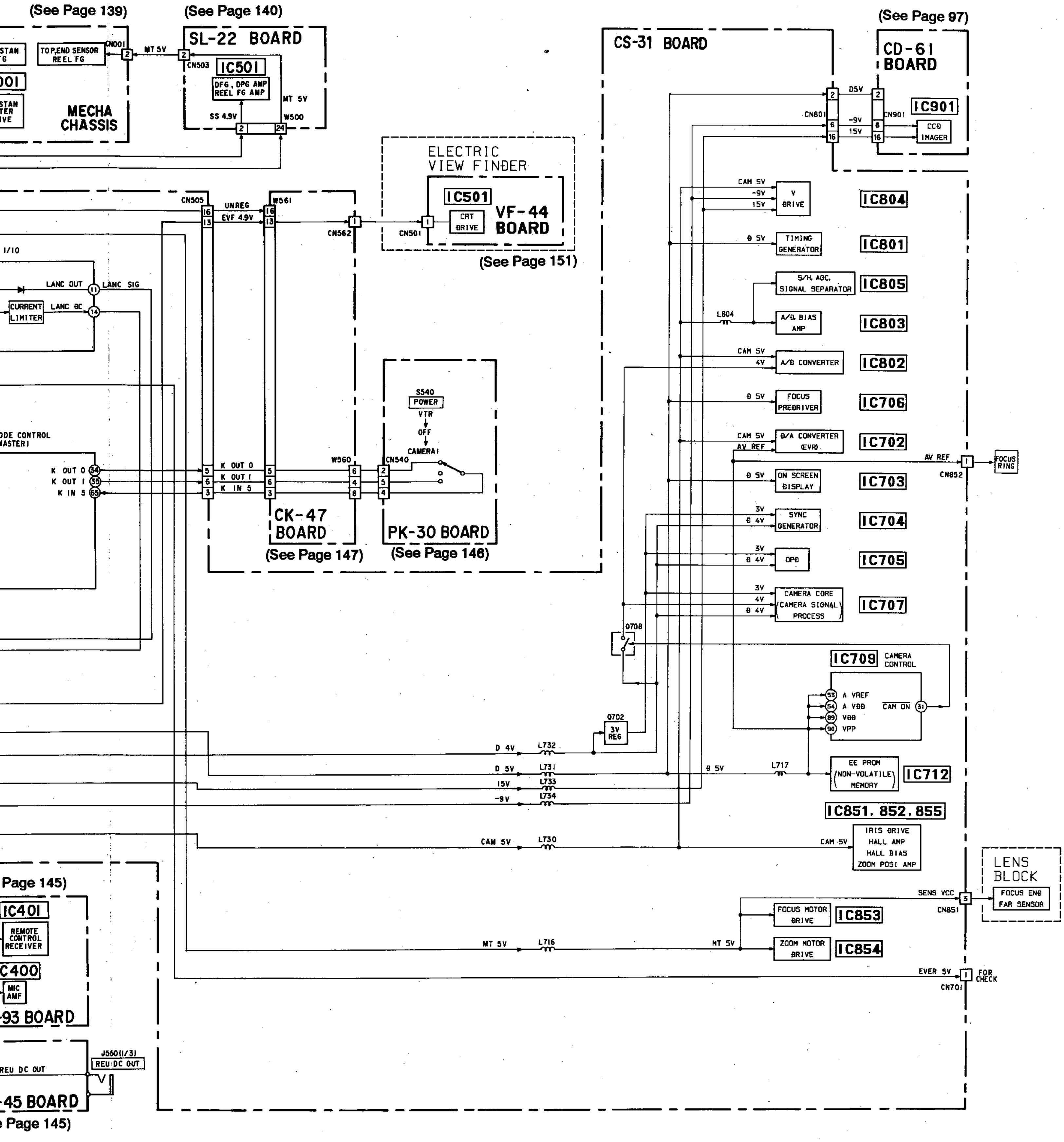
Q501
VIDEO OUT
W502
G1
V901
PICTURE TUBE
12.5Vp-p
H
Q501 Ⓒ VTR REC
RV501
CONTRAST
1Vp-p
⑨ VTR REC
T501
FBT
2.8Vp-p
H
IC501 ⑪ VTR REC
2.4Vp-p
H
⑭ VTR REC
EVF 5V
Q503
H OUT
Q502
HOLD DOWN
EVF 5V
C504
H SIZE
D503
DUMPER
SOL501
RV502
FOCUS
G3
G2
W502
H
H
HV
H DRIVE
LKG MIX
RV503
BRIGHT
L901
DEFLECTION YOKE
H
V
CN503
DH2
DH1
L503
(HLC)
CN502
DV2
DV1
V OUT
2Vp-p
V
IC501 ③ VTR REC
RV505
V SIZE
2Vp-p
V
IC501 ⑤ VTR REC

3-15. POWER BLOCK DIAGRAM


PS-282 BOARD (1/2)
(See Page 153)
CS-
(See
F950
F951
L951
L952
L953
L954
J950
EASY
CONECTOR
RFU DC OUT
IC950
(1/2)
DC/DC CONVERTER/
CAPSTAN,DRUM PWM DRIVE
VCC
X950
475KHz
TRIANGLE
OSC
PWM MOD
SWITCHING
DRIVE
VOLTAGE ERROR AMP
V REF
(2.5V)
REF
VREF
(IC950 ⑲)
SHORT CIRCUIT
DETECT
VTR ON
ON/OFF
POWER
SHORT CIRCUIT
PROTECT
CAM ON
CTL B
CAPSTAN/DRUM
PWM DRIVE
(SERVO)
Q953,954
DRUM/CAPSTAN
PWM DRIVE
(SERVO)
UNREG
Q952
SWITCHING
L957
5V
D964
Q958
(1/2)
CAM ON
CAM 5V
Q951
SWITCHING
T950
D950(1/2)
CAM 15V
RECT
CAM -9V
RECT
L958
L959
Q955
EMERGENCY
DETECT
CN950
CN501
VTR UNREG
L962
SST 5V
VTR ON
CAM ON
J951
REMOTE
LANC SIG
LANC DC
MOTOR UNREG
EVF 5V
L963
L961
AUDIO 5V
D 5V
Q959,960
4V
RE
D 4V
VREF
(IC950 ⑲)
15V
-9V
Q957,958(1/2)
CAM 5V
L960
VIDEO 5V
RP 4.9
REV DI
VTR O
CAM O
LANC
LANC
IC
IC

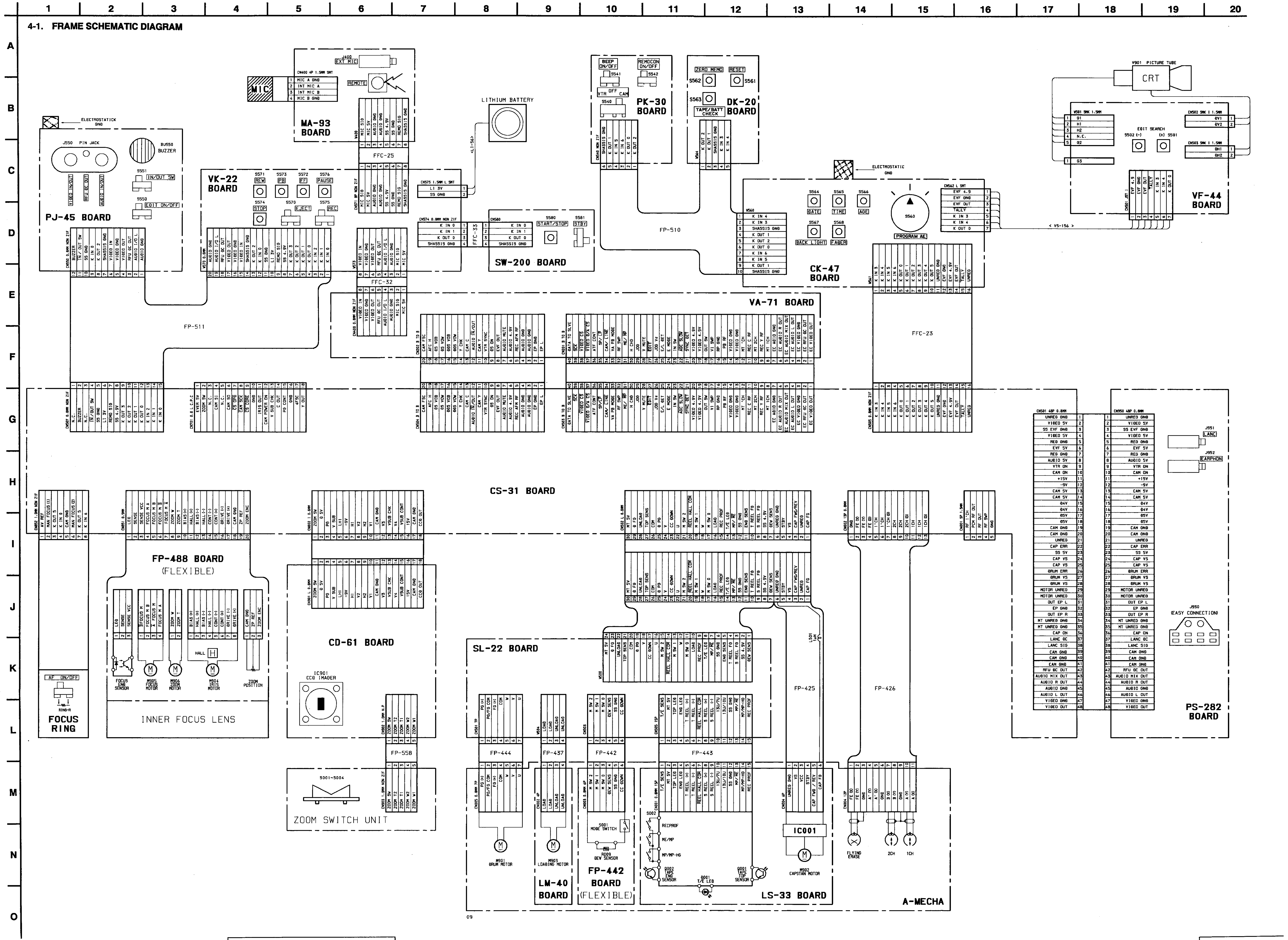


(See Page
CS-31 BOARD
(See Page 105, 110, 114, 117, 119)
IC505
DRUM MOTOR DRIVE
IC501
ATF SERVO
CLOG DETECT
PB SP/LP DETECT
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
VCC
CN004
CN502
MECH
CHASS
UNREG
5V
SS 5V
UNREG
MOTOR UNREG
PS501
Q509
5V REG
MT.5V
IC503 SERVO/ MECHANISM CONTROL
(VPP)
VDD
AVDD
AVREF
BATT SENSE
RESET
L503
IC510 LOADING MOTER DRIVE
VR
VC
IC502 LANC I/O
EVER 5V
WAKE UP
LANC OUT
UNREG
5.6V REG
CURRENT LIMITER
LANC DC
PWR CONT
CN950
VTR UNREG
CN501
L962
SST 5V
IC508
5V REG
EVER 5V
IC507
BET
BATTERY IN DETECT
BATT IN
BACK UP VDD
INITIAL RESET
RESET
LITHIUM BATTERY PRE END DETECT
LI PRE END
D501
LI 3V
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
K OUT 0
K OUT 1
K IN 5
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
L958
L959
VTR ON
CAM ON
LANC SIG
LANC DC
MOTOR UNREG
EVF 5V
L963
L961
AUDIO 5V
D 5V
Q959,960
4V RE
D 4V
VREF
(IC950 ⑲)
15V
-9V
Q957,958(1/2)
CAM 5V
CN507
LI3V
SS 4.9V
(See Page 145)
VA-71 BOARD
(See Page 127, 132, 135)
IC001
IC002
VIDEO(2) REC/PB AMP
AUDIO 4.9V
CN504
CN202
CN201
IC201 ~ IC206
IC301
IC051 ~ IC054
MIC 5V
AUDIO PROCESS
IC401
IC400
L960
VIDEO 5V
RP 4.9V
VIDEO 4.9V
Q990,991
CURRENT LIMITER
VIDEO (1) (Y/CHROMA PROCESS)
REV DC OUT
EC RFU DC OUT
CN503
CN400
W570
CN575
LITHIUM BATTERY
LI3V
CN571
W573
W570
VK-22 BOARD
(See Page 146)
W400
IC401
REMOTE CONTROL RECEIVER
IC400
MIC AMP
MA-93 BOARD
REV DC OUT
CN550
PJ-45 BOARD
(See Page 145)


(See Page 139)
(See Page 140)
(See Page 97)
STAN
G
001
STAN
TER
IVE
TOP,END SENSOR
REEL FG
CN001
2
MT 5V
MECHA
CHASSIS
SL-22 BOARD
2
CN503
IC501
DFG, DPG AMP
REEL FG AMP
MT 5V
SS 4.9V
W500
2
24
CS-31 BOARD
CD-61
BOARD
2
6
16
CN801
D5V
-9V
15V
2
6
16
CN901
IC901
CCD
IMAGER
ELECTRIC
VIEW FINDER
IC501
CRT
DRIVE
VF-44
BOARD
CN501
1
(See Page 151)
CN505
UNREG
EVF 4.9V
16
13
W561
16
13
CN562
1
1/10
LANC OUT
LANC SIG
11
CURRENT
LIMITER
LANC DC
14
ODE CONTROL
MASTER)
K OUT 0
K OUT 1
K IN 5
34
35
65
5
6
3
K OUT 0
K OUT 1
K IN 5
5
6
3
W560
6
4
8
CN540
2
5
4
S540
POWER
VTR
OFF
CAMERA1
CK-47
BOARD
(See Page 147)
PK-30 BOARD
(See Page 146)
CAM 5V
-9V
15V
V
DRIVE
IC804
D 5V
TIMING
GENERATOR
IC801
S/H, AGC,
SIGNAL SEPARATOR
IC805
L804
A/D, BIAS
AMP
IC803
CAM 5V
4V
A/D CONVERTER
IC802
D 5V
FOCUS
PREDRIVER
IC706
CAM 5V
AV REF
D/A CONVERTER
(EVR)
IC702
AV REF
1
CN852
FOCUS
RING
D 5V
ON SCREEN
DISPLAY
IC703
3V
D 4V
SYNC
GENERATOR
IC704
3V
D 4V
OPD
IC705
3V
4V
D 4V
CAMERA CORE
(CAMERA SIGNAL
PROCESS)
IC707
Q708
IC709
CAMERA
CONTROL
53
A VREF
54
A VDD
89
VDD
90
VPP
CAM ON
31
Q702
3V
REG
D 4V
L732
D 5V
L731
15V
L733
-9V
L734
D 5V
L717
EE PROM
(NON-VOLATILE
MEMORY)
IC712
IC851, 852, 855
CAM 5V
L730
CAM 5V
IRIS DRIVE
HALL AMP
HALL BIAS
ZOOM POSI AMP
LENS
BLOCK
SENS VCC
3
CN851
FOCUS END
FAR SENSOR
FOCUS MOTOR
DRIVE
IC853
MT 5V
L716
MT 5V
ZOOM MOTOR
DRIVE
IC854
EVER 5V
1
CN701
FOR
CHECK
Page 145)
IC401
REMOTE
CONTROL
RECEIVER
C400
MIC
AMP
-93 BOARD
J550(1/3)
REU DC OUT
REU DC OUT
-45 BOARD
e Page 145)

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


PJ-45 BOARD
J550 PIN JACK
BU550 BUZZER
ELECTROSTATICK GND
VK-22 BOARD
MA-93 BOARD
MIC
J450 EXT MIC
REMOTE
FFC-25
LITHIUM BATTERY
SW-200 BOARD
START/STOP
STBY
PK-30 BOARD
BEEP ON/OFF
REMOCON ON/OFF
DK-20 BOARD
ZERO MEMO
RESET
TAPE/BATT CHECK
CK-47 BOARD
PROGRAM AE
BACK LIGHT
FADER
DATE
TIME
FP-510
FP-511
FFC-32
FFC-23
VA-71 BOARD
V901 PICTURE TUBE
CRT
EDIT SEARCH
VF-44 BOARD
ELECTROSTATIC GND
CS-31 BOARD
FP-488 BOARD (FLEXIBLE)
INNER FOCUS LENS
FOCUS RING
AF ON/OFF
CD-61 BOARD
IC501 CCD IMAGER
FP-558
S001-S004
ZOOM SWITCH UNIT
SL-22 BOARD
FP-444
FP-437
FP-442
FP-443
FP-425
FP-426
LM-40 BOARD
FP-442 BOARD (FLEXIBLE)
LS-33 BOARD
IC001
A-MECHA
M901 DRUM MOTOR
M903 LOADING MOTOR
M902 CAPSTAN MOTOR
FLYING ERASE
2CH
1CH
PS-282 BOARD
J951 LANC
J952 EARPHONE
J950 (EASY CONNECTION)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N O

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- —— : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ▨ : Pattern from the side which enables seeing. } The inner two layers' patterns are not indicated.
- ░ : Pattern of the rear side. }
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the pattern face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.
- —— : B+ Line.
- - - - : B– Line.
- ⇨ : IN/OUT direction of (+, –) B LINE.
- Circled numbers refer to waveforms.

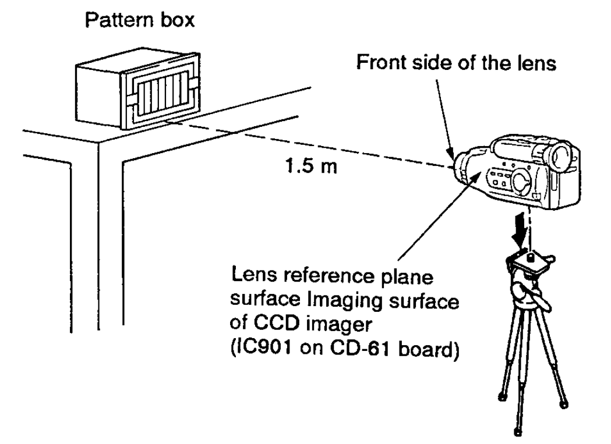
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA, DIGITAL TITLE block)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.
  Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-61 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

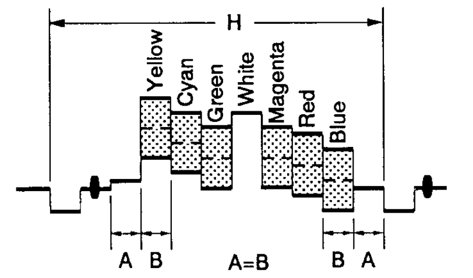


Fig. a (Video output terminal output waveform)

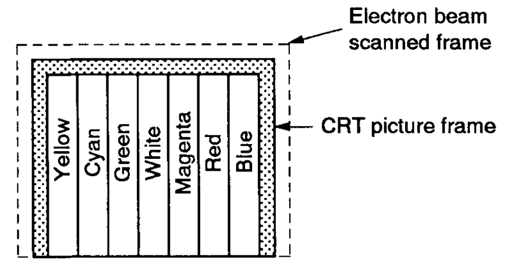


Fig. (Picture on monitor TV)

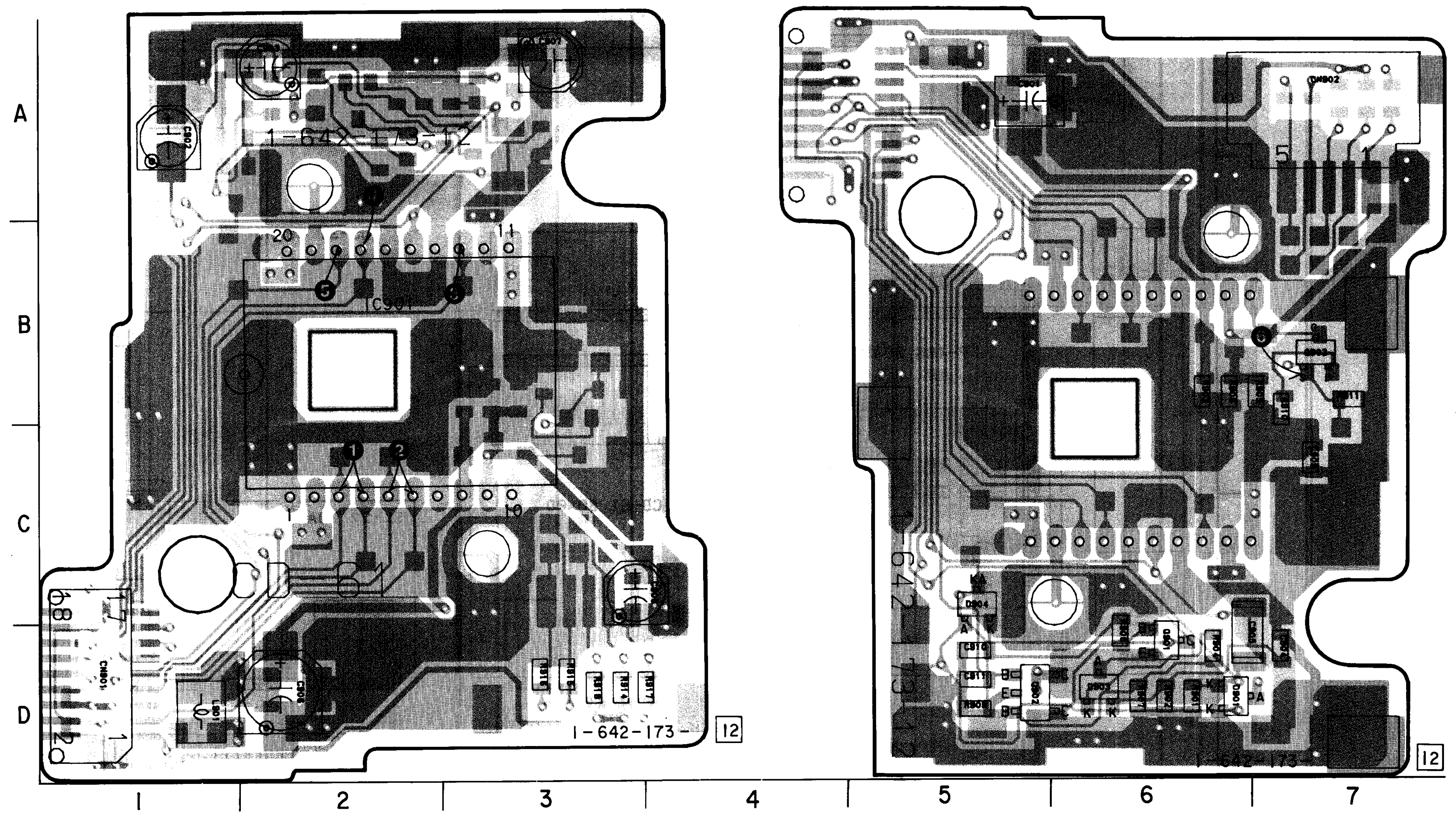
(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)
- Voltages are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.

CD-61 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-61 BOARD: 1000 series —

CD-61 BOARD (COMPONENT SIDE)

CD-61 BOARD (CONDUCTOR SIDE)



(DIODE)

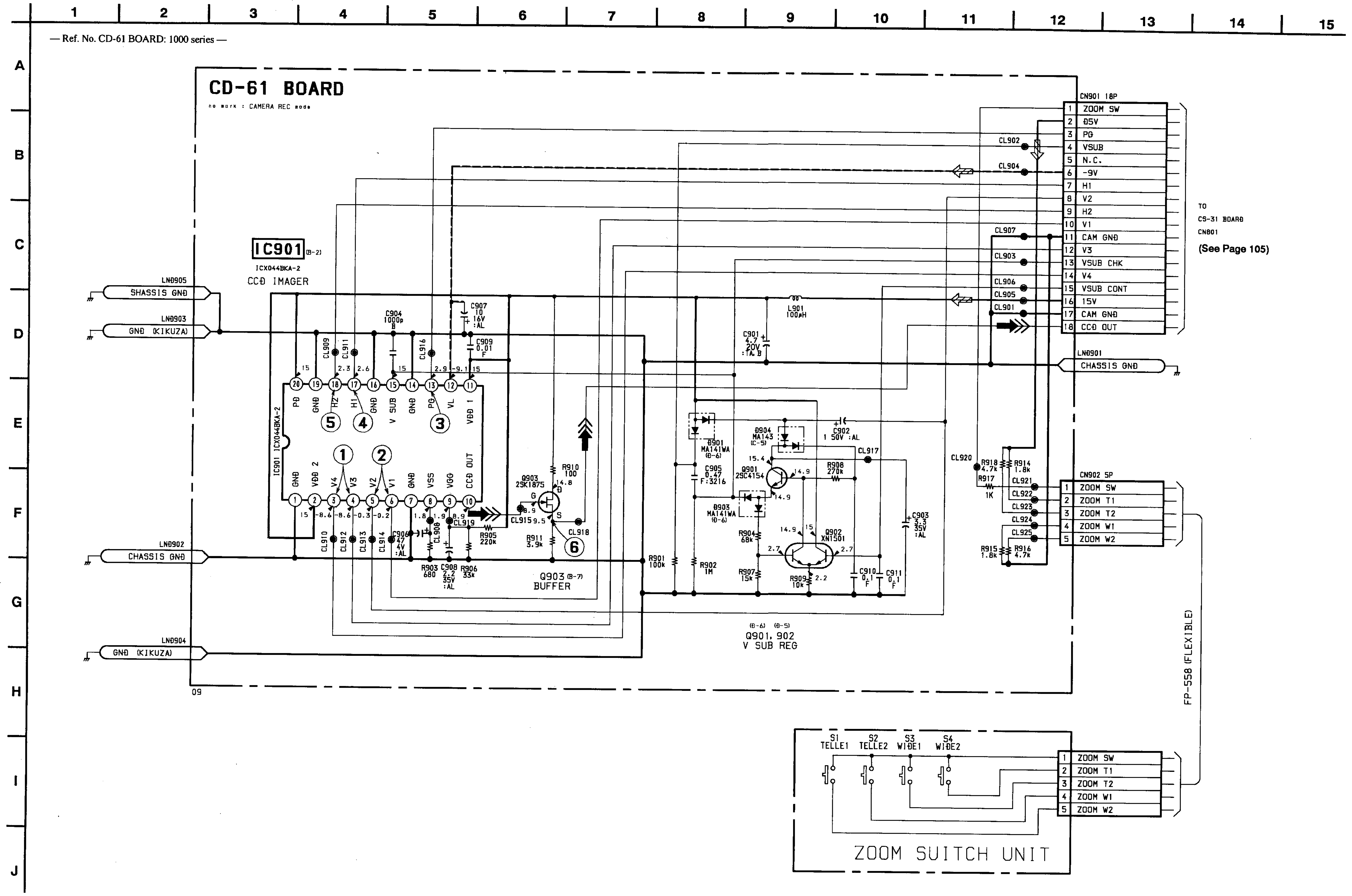
D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

(TRANSISTOR)

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875-BL/V-TE85L

CD-61 (CCD DRIVE) SCHEMATIC DIAGRAM

— Ref. No. CD-61 BOARD: 1000 series —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A
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C
D
E
F
G
H
I
J
CD-61 BOARD
no mark : CAMERA REC mode
IC901 (B-2)
ICX044BKA-2
CCD IMAGER
LND905
SHASSIS GND
LND903
GND (KIKUZA)
LND902
CHASSIS GND
LND904
GND (KIKUZA)
IC901 ICX044BKA-2
PD
GND
H2
H1
GND
V SUB
GND
PG
VL
VDD 1
GND
VDD 2
V4
V3
V2
V1
GND
VSS
VGG
CCD OUT
C904 1000p B
C907 10 16V :AL
C909 0.01 F
CL909
CL911
CL916
CL910
CL912
CL913
CL914
C906 47 4V :AL
CL908
CL919
R903 680
C908 2.2 35V :AL
R906 33k
R905 220k
Q903 2SK1875
R910 100
R911 3.9k
CL915
CL918
Q903 (B-7) BUFFER
R901 100k
R902 1M
L901 100μH
C901 4.7 20V :TA.B
D901 MA141WA (D-6)
D904 MA143 (C-5)
C902 1 50V :AL
CL917
C905 0.47 F:3216
Q901 2SC4154
R908 270k
D903 MA141WA (D-6)
R904 68k
Q902 XN1501
R907 15k
R909 10k
C910 0.1 F
C911 0.1 F
C903 3.3 35V :AL
(D-6) (D-5)
Q901, 902
V SUB REG
CN901 18P
1 ZOOM SW
2 D5V
3 PG
4 VSUB
5 N.C.
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GND
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GND
18 CCD OUT
CL902
CL904
CL907
CL903
CL906
CL905
CL901
TO
CS-31 BOARD
CN801
(See Page 105)
LND901
CHASSIS GND
CL920
R918 4.7k
R914 1.8k
R917 1K
CL921
CL922
CL923
CL924
CL925
R915 1.8k
R916 4.7k
CN902 5P
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
FP-558 (FLEXIBLE)
S1 TELLE1
S2 TELLE2
S3 WIDE1
S4 WIDE2
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
ZOOM SUITCH UNIT
09

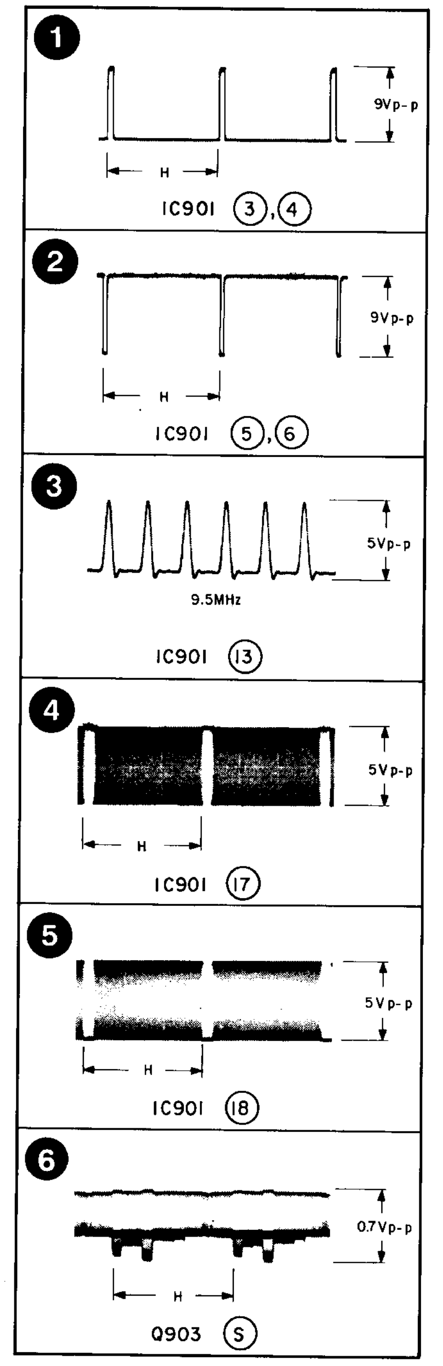
Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-61 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-31 board), and also written on the CCD data label put on the shield case (upper) of the PS-282 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-61 board supplied as the repair parts.
  When replacing the CD-61 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	
PB				

CD-61 BOARD



CS-31 (CAMERA, REC/PB AMP, SERVO/SYSTEM CONTROL), FP-488 (INNER FOCUS LENS) PRINTED WIRING BOARDS

— Ref. No. CS-31 BOARD: 1000 series —

(DIODE)

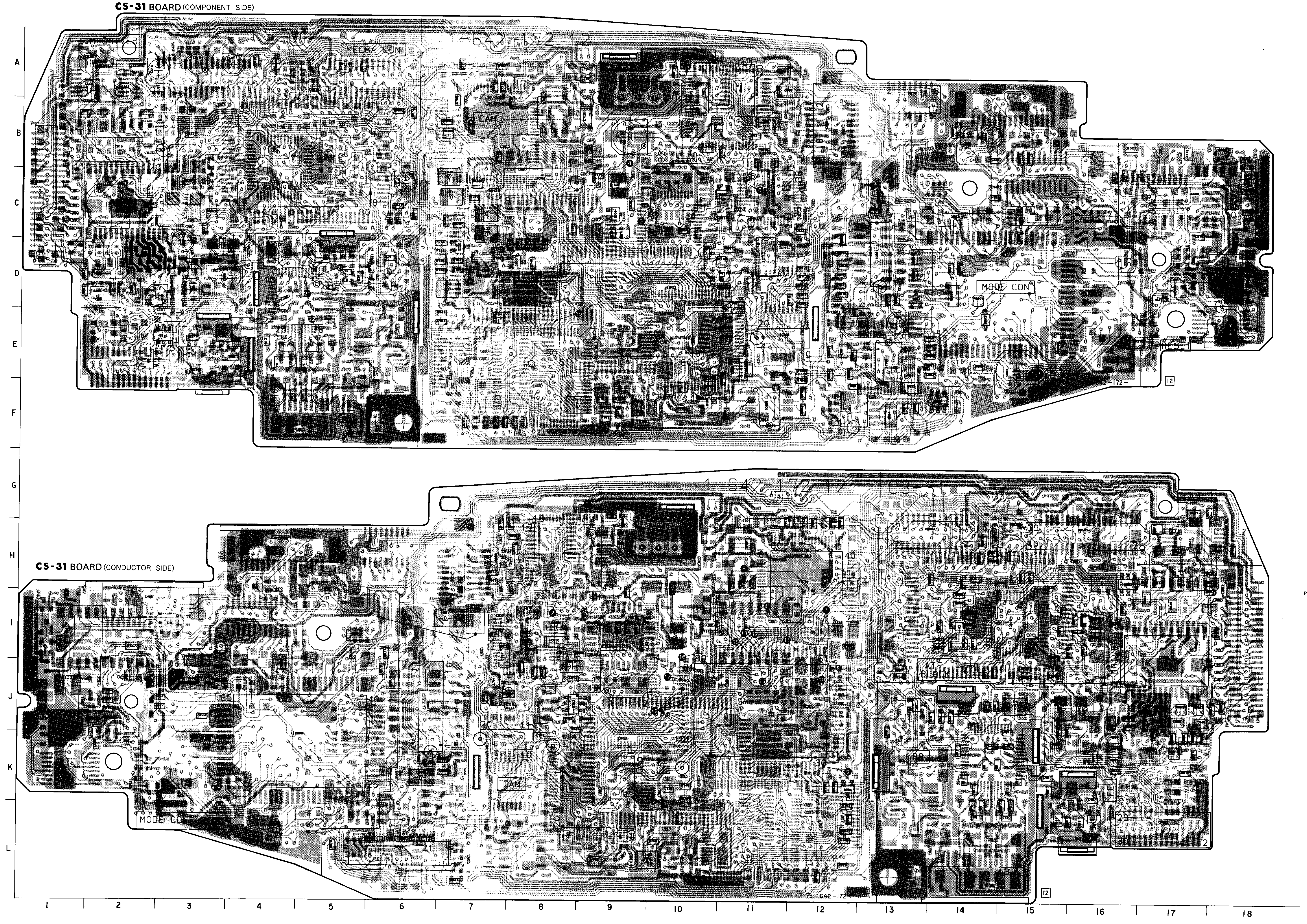
⚠D501	8-719-421-27	DIODE	MA728
D502	8-719-404-46	DIODE	MA110
D503	8-719-110-03	DIODE	RD7. 5ES-B2
D504	8-719-941-86	DIODE	DAN202U
D506	8-719-404-46	DIODE	MA110
D507	8-719-404-46	DIODE	MA110

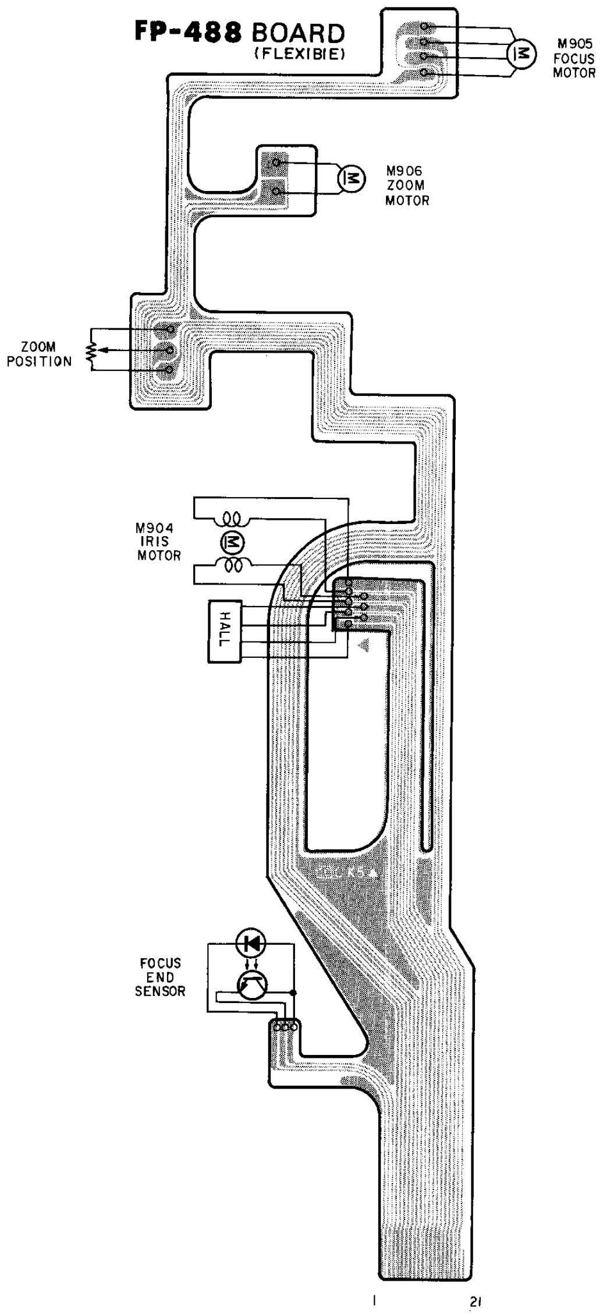
(IC)

IC001	8-752-033-38	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F-EL
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-833-85	IC	CXP80624-262Q
IC505	8-759-990-55	IC	CXA8006M
IC506	8-759-067-50	IC	uPD75316GF-217-3BE
IC507	8-759-511-22	IC	CXA1448N
IC508	8-759-512-69	IC	S-81350HG-KD
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-30	IC	uPD6456GS-618-E2
IC704	8-752-348-92	IC	CXD2101AR-T6
IC705	8-759-519-13	IC	CXD2103R-T6
IC706	8-752-337-36	IC	CXD2104N
IC707	8-752-337-32	IC	CXD2100Q
IC709	8-752-834-24	IC	CXP80624-261Q
IC712	8-759-044-78	IC	AK6420F
IC801	8-752-337-34	IC	CXD1257R
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-981-82	IC	RC3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M
IC855	8-759-998-98	IC	LM358D

(TRANSISTOR)

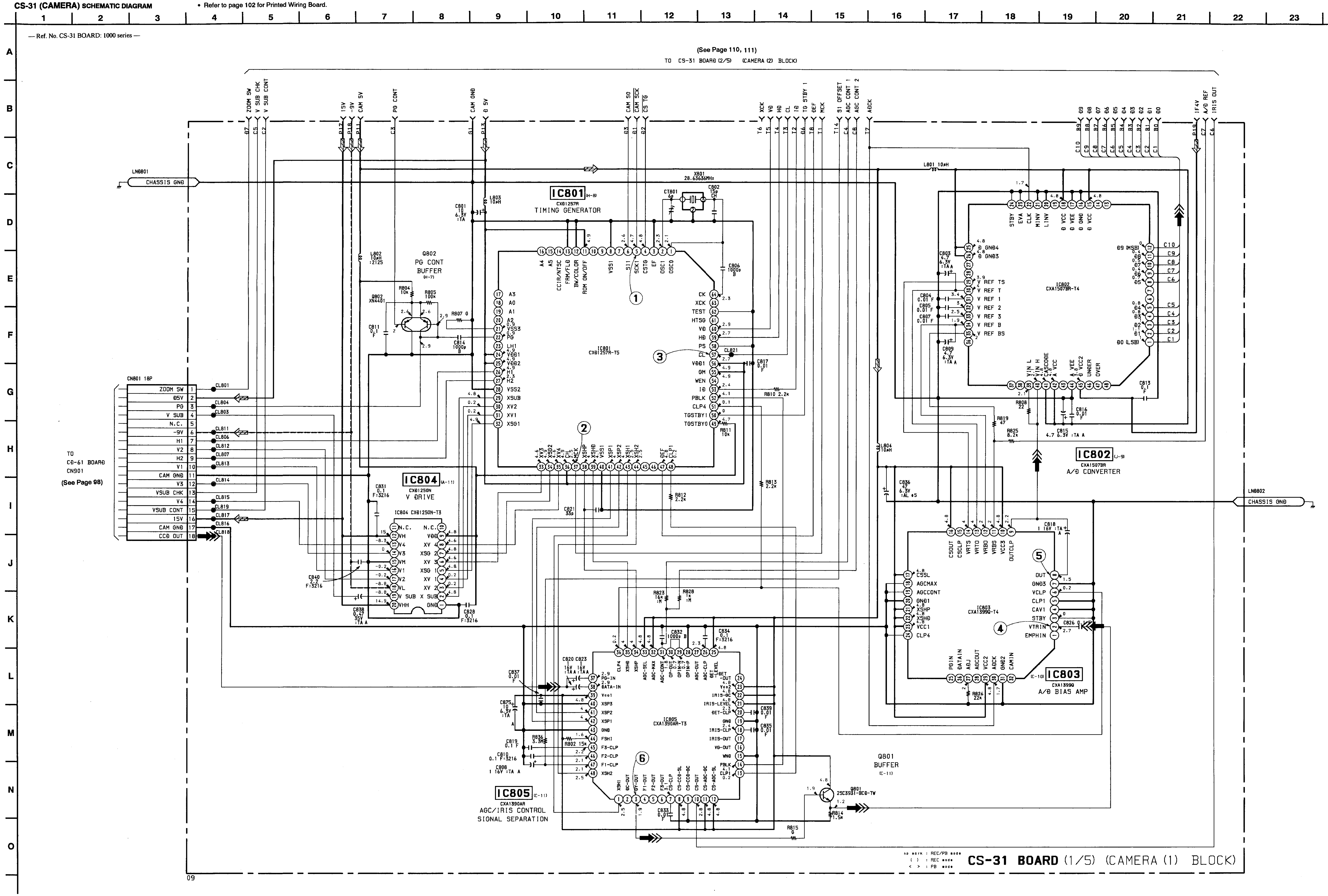
Q002	8-729-905-35	TRANSISTOR	2SC4081-R
Q003	8-729-905-12	TRANSISTOR	DTA144EU
Q041	8-729-905-23	TRANSISTOR	2SA1576-R
Q042	8-729-920-XX	TRANSISTOR	DTA114EUT106
Q043	8-729-216-22	TRANSISTOR	2SA1162-G
Q501	8-729-907-00	TRANSISTOR	DTC114EU
Q502	8-729-402-78	TRANSISTOR	XN6401
Q503	8-729-905-35	TRANSISTOR	2SC4081-R
Q504	8-729-921-08	TRANSISTOR	DTC144TU
Q505	8-729-905-23	TRANSISTOR	2SA1576-R
Q506	8-729-905-18	TRANSISTOR	DTC144EU
Q507	8-729-905-12	TRANSISTOR	DTA144EU
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST
Q510	8-729-402-81	TRANSISTOR	XN4501
Q511	8-729-402-81	TRANSISTOR	XN4501
Q702	8-729-402-84	TRANSISTOR	XN4601
Q703	8-729-602-36	TRANSISTOR	2SA1602-F
Q704	8-729-602-36	TRANSISTOR	2SA1602-F
Q707	8-729-927-XX	TRANSISTOR	2SC4617TL-QR
Q708	8-729-920-XX	TRANSISTOR	DTA114EUT106
Q709	8-729-905-61	TRANSISTOR	DTC124EU
Q801	8-729-423-52	TRANSISTOR	2SC3931-C
Q802	8-729-403-27	TRANSISTOR	XN4401
Q851	8-729-602-21	TRANSISTOR	2SC4154-F
Q853	8-729-403-27	TRANSISTOR	XN4401





CS-31 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 102 for Printed Wiring Board.

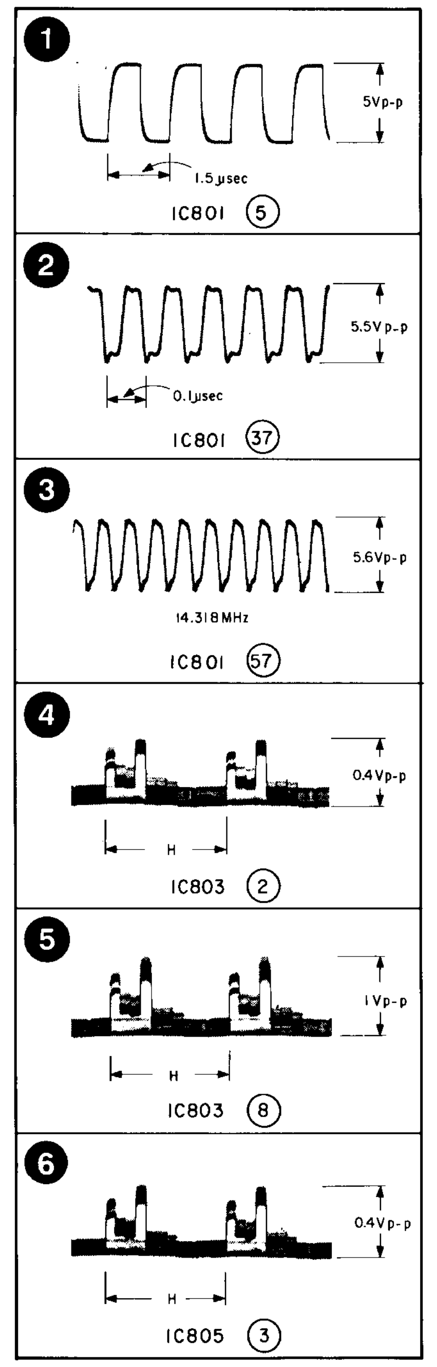

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
A B C D E F G H I J K L M N O
— Ref. No. CS-31 BOARD: 1000 series —
(See Page 110, 111)
TO CS-31 BOARD (2/5) (CAMERA (2) BLOCK)
ZOOM SW
V SUB CHK
V SUB CONT
15V
-9V
CAM 5V
PG CONT
CAM GND
D 5V
CAM SO
CAM SCK
CS TG
XCK
VD
HD
CL
ID
TG STBY 1
DEF
MCK
S1 OFFSET
AGC CONT 1
AGC CONT 2
ADCK
D9 D8 D7 D6 D5 D4 D3 D2 D1 D0
1F4V
A/D REF
IRIS OUT
LN0801
CHASSIS GND
X801
28.63636MHz
IC801
CXD1257R
TIMING GENERATOR
Q802
PG CONT
BUFFER
L801 10uH
L803 10uH
CN801 18P
ZOOM SW
D5V
PG
V SUB
N.C.
-9V
H1
V2
H2
V1
CAM GND
V3
VSUB CHK
V4
VSUB CONT
15V
CAM GND
CCD OUT
TO
CD-61 BOARD
CN901
(See Page 98)
IC804
CXD1250N
V DRIVE
IC802
CXA1507AR-T4
IC802
CXA1507AR
A/D CONVERTER
LN0802
CHASSIS GND
IC803
CXA1399Q
A/D BIAS AMP
IC805
CXA1390AR
AGC/IRIS CONTROL
SIGNAL SEPARATION
Q801
BUFFER
2SC3931-BCD-TW
① ② ③ ④ ⑤ ⑥
09
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-31 BOARD (1/5) (CAMERA (1) BLOCK)

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡》	➡》》	
PB				

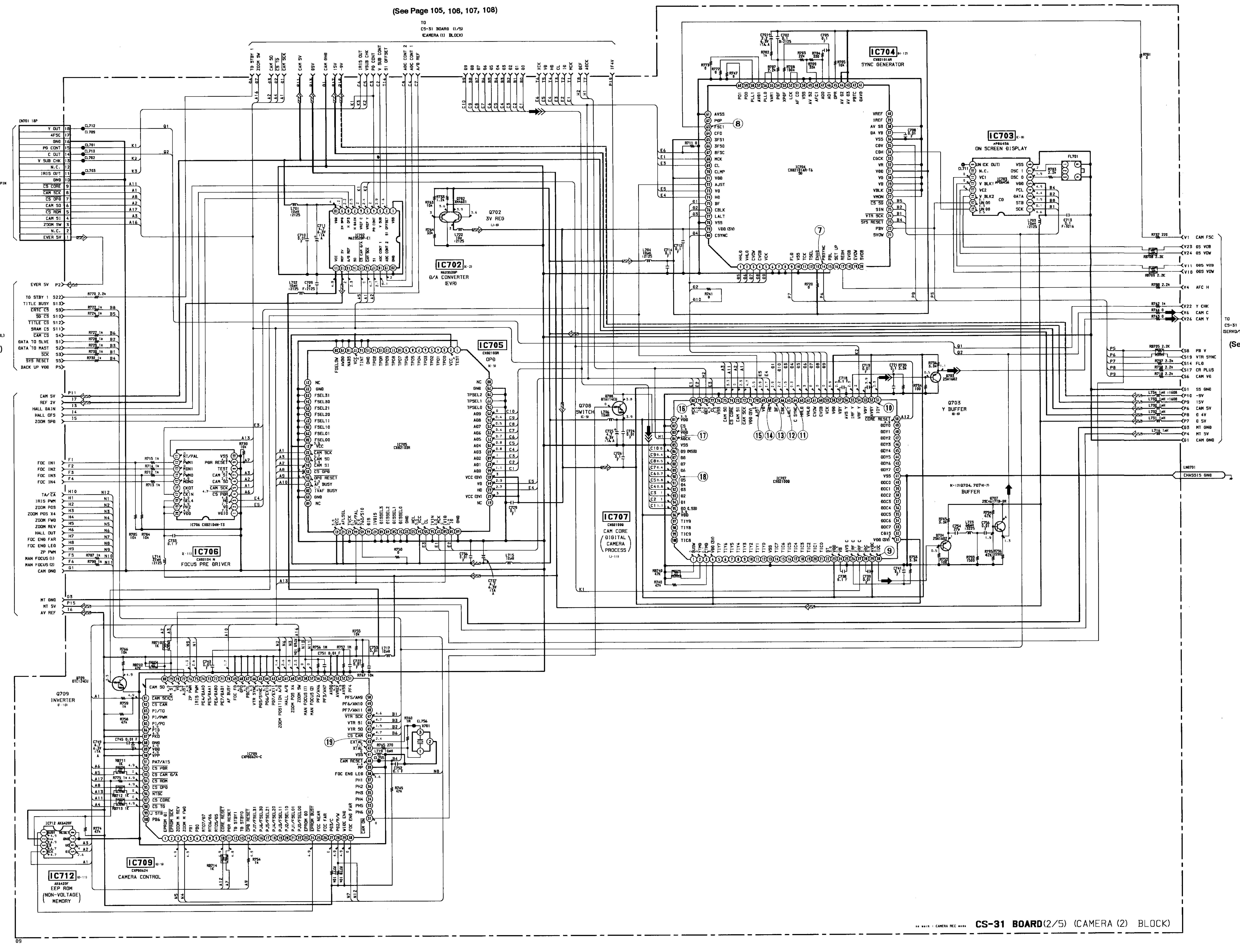
CS-31 BOARD (1/5)



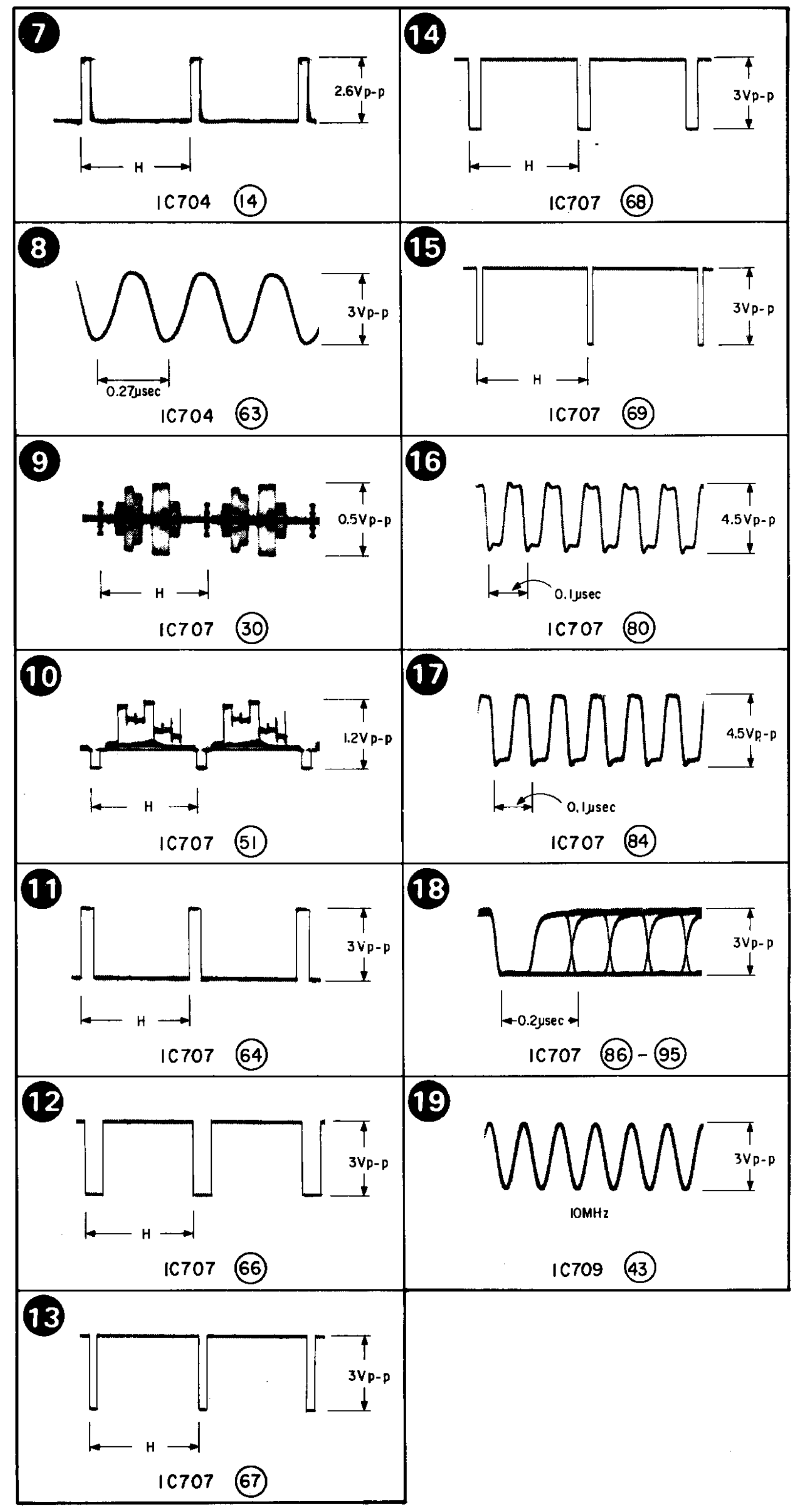
CS-31 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 102 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —


(See Page 105, 106, 107, 108)
TO CS-31 BOARD (1/5) (CAMERA (1) BLOCK)
IC704 SYNC GENERATOR
IC703 ON SCREEN DISPLAY
IC702 D/A CONVERTER (EVR)
Q702 3V REG
IC705 CPG
TO CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL)
(See Page 120)
TO CS-31 BOARD (5/5) CAMERA (3) BLOCK
(See Page 115)
IC706 FOCUS PRE DRIVER
Q708 SWITCH
Q703 Y BUFFER
IC707 CAM CORE (DIGITAL CAMERA PROCESS)
TO CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL)
(See Page 119, 120)
CHASSIS GND
Q709 INVERTER
IC709 CAMERA CONTROL
IC712 EEP ROM (NON-VOLTAGE MEMORY)
no mark : CAMERA REC mode
CS-31 BOARD(2/5) (CAMERA (2) BLOCK)

CS-31 BOARD (2/5)



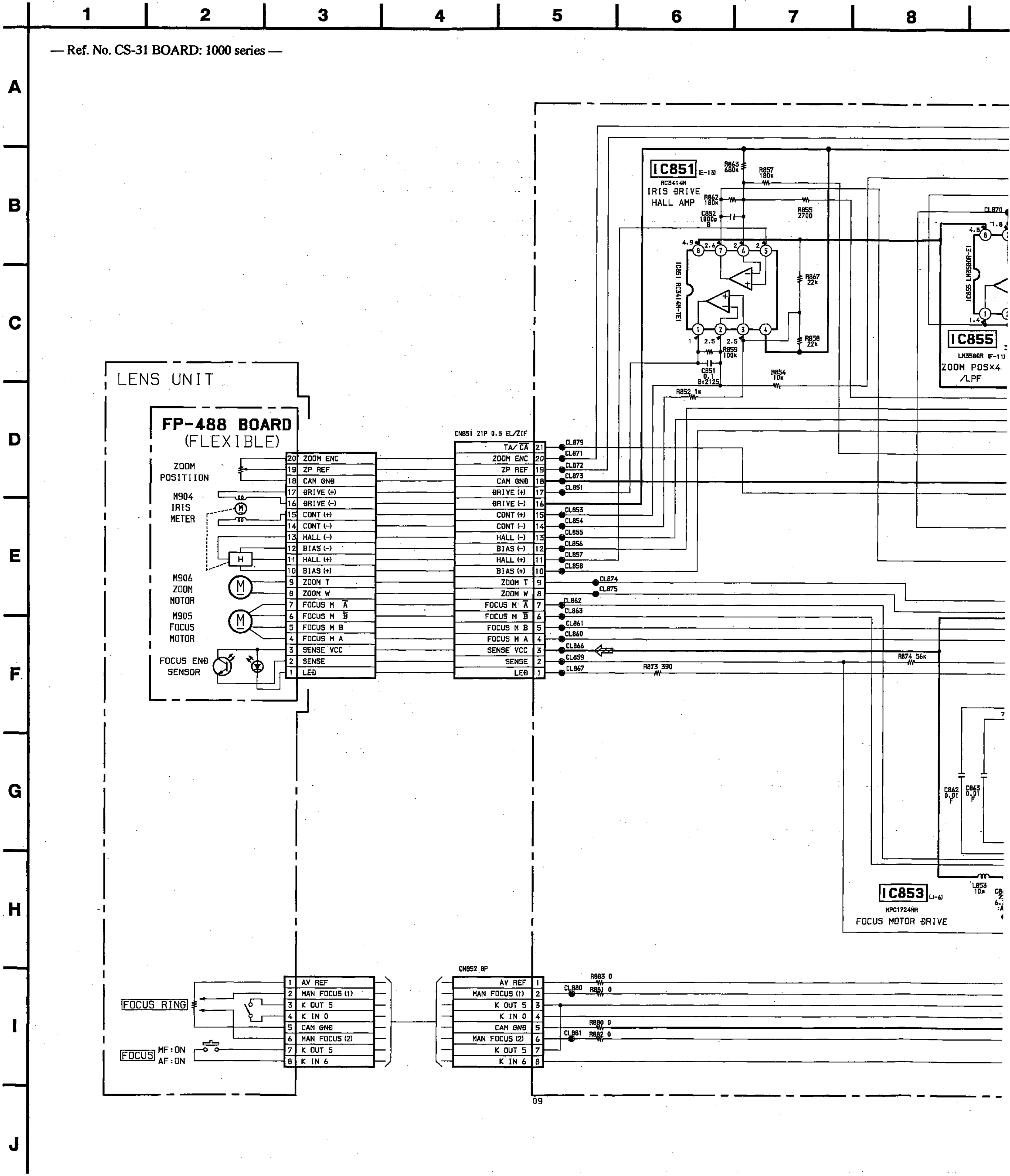
• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»	
PB				

CS-31 (CAMERA), FP-488 (INNER FOCUS LENS) SCHEMATIC DIAGRAMS

• Refer to page 102 for Printed Wiring Board.

— Ref. No. CS-31 BOARD: 1000 series —



1
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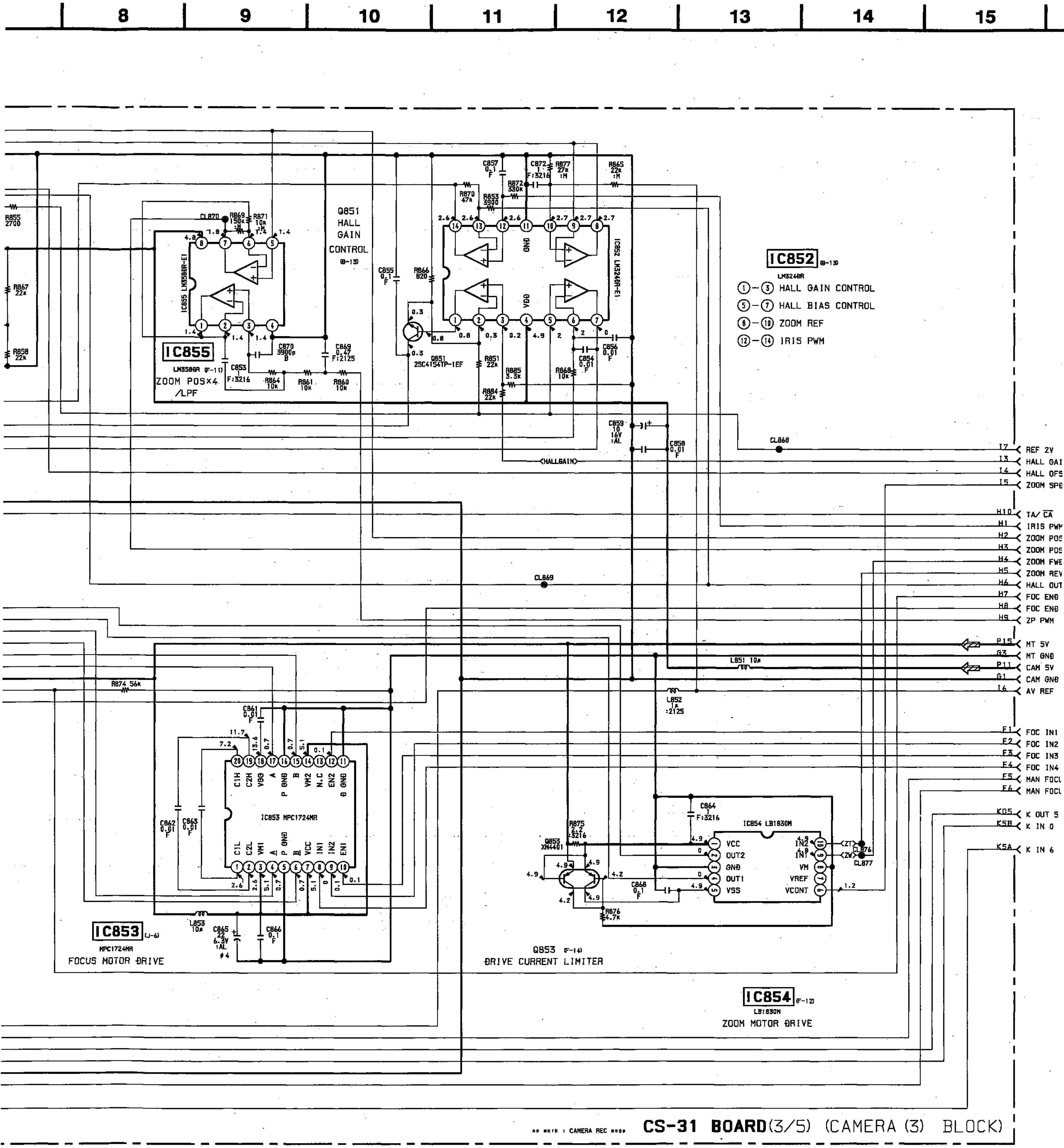
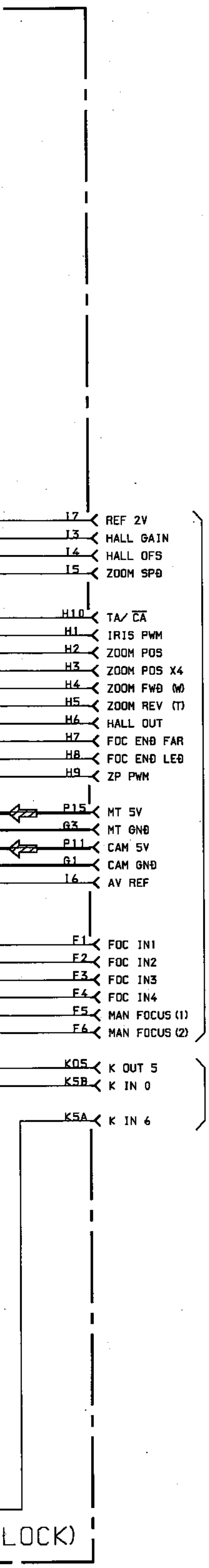
A
B
C
D
E
F
G
H
I
J
LENS UNIT
FP-488 BOARD
(FLEXIBLE)
ZOOM POSITIION
M904 IRIS METER
H
M906 ZOOM MOTOR
M905 FOCUS MOTOR
FOCUS END SENSOR
20 ZOOM ENC
19 ZP REF
18 CAM GND
17 DRIVE (+)
16 DRIVE (-)
15 CONT (+)
14 CONT (-)
13 HALL (-)
12 BIAS (-)
11 HALL (+)
10 BIAS (+)
9 ZOOM T
8 ZOOM W
7 FOCUS M A
6 FOCUS M B
5 FOCUS M B
4 FOCUS M A
3 SENSE VCC
2 SENSE
1 LED
CN851 21P 0.5 EL/ZIF
TA/CA 21
CL879
CL871
CL872
CL873
CL851
CL853
CL854
CL855
CL856
CL857
CL858
CL874
CL875
CL862
CL863
CL861
CL860
CL866
CL859
CL867
R873 390
R874 56k
IC851 (E-13)
RC3414M
IRIS DRIVE
HALL AMP
IC851 RC3414M-TE1
R863 680k
R857 180k
R862 180k
C852 1000p B
R855 2700
R867 22k
R858 22k
R859 100k
C851 0.1 B:2125
R852 1k
R854 10k
4.9
2.6
2
2
1
2.5
2.5
IC855 (F-11)
LM358BR
ZOOM POS×4 /LPF
IC855 LM358BR-E1
CL870
4.8
1.8
1.4
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
C862 0.01 F
C863 0.01 F
L853 10µ
FOCUS RING
FOCUS
MF:ON
AF:ON
1 AV REF
2 MAN FOCUS (1)
3 K OUT 5
4 K IN 0
5 CAM GND
6 MAN FOCUS (2)
7 K OUT 5
8 K IN 6
CN852 8P
CL880
CL881
R883 0
R881 0
R880 0
R882 0
09

Printed Wiring Board.


8
9
10
11
12
13
14
15
IC855
LM358BR (F-11)
ZOOM POS×4 /LPF
Q851 HALL GAIN CONTROL (B-13)
Q851 2SC4154TP-1EF
IC852 (B-13)
LM324BR
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
IC852 LM324BR-E1
IC855 LM358BR-E1
CL868
CL869
CL870
<HALLGAIN>
I7 REF 2V
I3 HALL GAI
I4 HALL OFS
I5 ZOOM SPE
H10 TA/CA
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS
H4 ZOOM FWD
H5 ZOOM REV
H6 HALL OUT
H7 FOC END
H8 FOC END
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCU
F6 MAN FOCU
K05 K OUT 5
K5B K IN 0
K5A K IN 6
L851 10µ
L852 1µ :2125
L853 10µ
R874 56k
IC853 MPC1724MR
C1H C2H VGB A P GND B VM2 N.C EN2 B GND
C1L C2L VM1 A P GND B VCC IN1 IN2 EN1
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
Q853 XN4401
R875 2.2 :3216
R876 4.7k
C864 1 F:3216
C868 0.1 F
IC854 LB1830M
VCC OUT2 GND OUT1 VSS
IN2 IN1 VM VREF VCONT
CL876
CL877
Q853 (F-14)
DRIVE CURRENT LIMITER
IC854 (F-12)
LB1830M
ZOOM MOTOR DRIVE
R855 2700
R867 22k
R858 22k
R869 150k
R871 10k
C870 3900p B
C853 1 F:3216
R864 10k
R861 10k
R860 10k
C869 0.47 F:2125
C855 0.1 F
R866 820
C857 0.1 F
R870 47k
R853 3900
R872 330k
C872 1 F:3216
R877 27k
R865 22k
R851 22k
R885 3.3k
R884 22k
R868 10k
C854 0.01 F
C856 0.01 F
C859 10 16V :AL
C858 0.01 F
C861 0.01 F
C862 0.01 F
C863 0.01 F
C865 22 6.3V :AL
C866 0.1 F

no mark : CAMERA REC mode **CS-31 BOARD**(3/5) (CAMERA (3) BLOCK)


I7 REF 2V
I3 HALL GAIN
I4 HALL OFS
I5 ZOOM SPD
H10 TA/ $\overline{\text{CA}}$
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS X4
H4 ZOOM FWD (W)
H5 ZOOM REV (T)
H6 HALL OUT
H7 FOC END FAR
H8 FOC END LED
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCUS (1)
F6 MAN FOCUS (2)
K05 K OUT 5
K5B K IN 0
K5A K IN 6
LOCK)

TO
CS-31 BOARD (2/5)
(CAMERA (2) BLOCK)

(See Page 110)

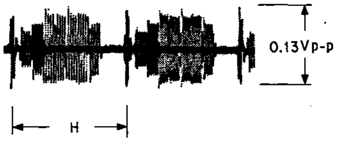
TO
CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 119)

— Re

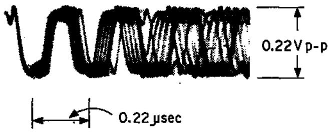
CS-31 BOARD (4/5)

20



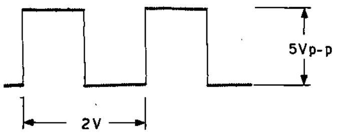
IC001 ② REC

21



IC001 ⑥ REC

22



IC001 ㊴ REC/PB

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	➡
PB	⇨	⇨≫	⇨⋙	⇨

A

B

C

D

E

F

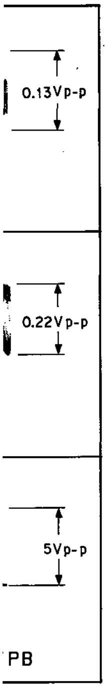
G

H

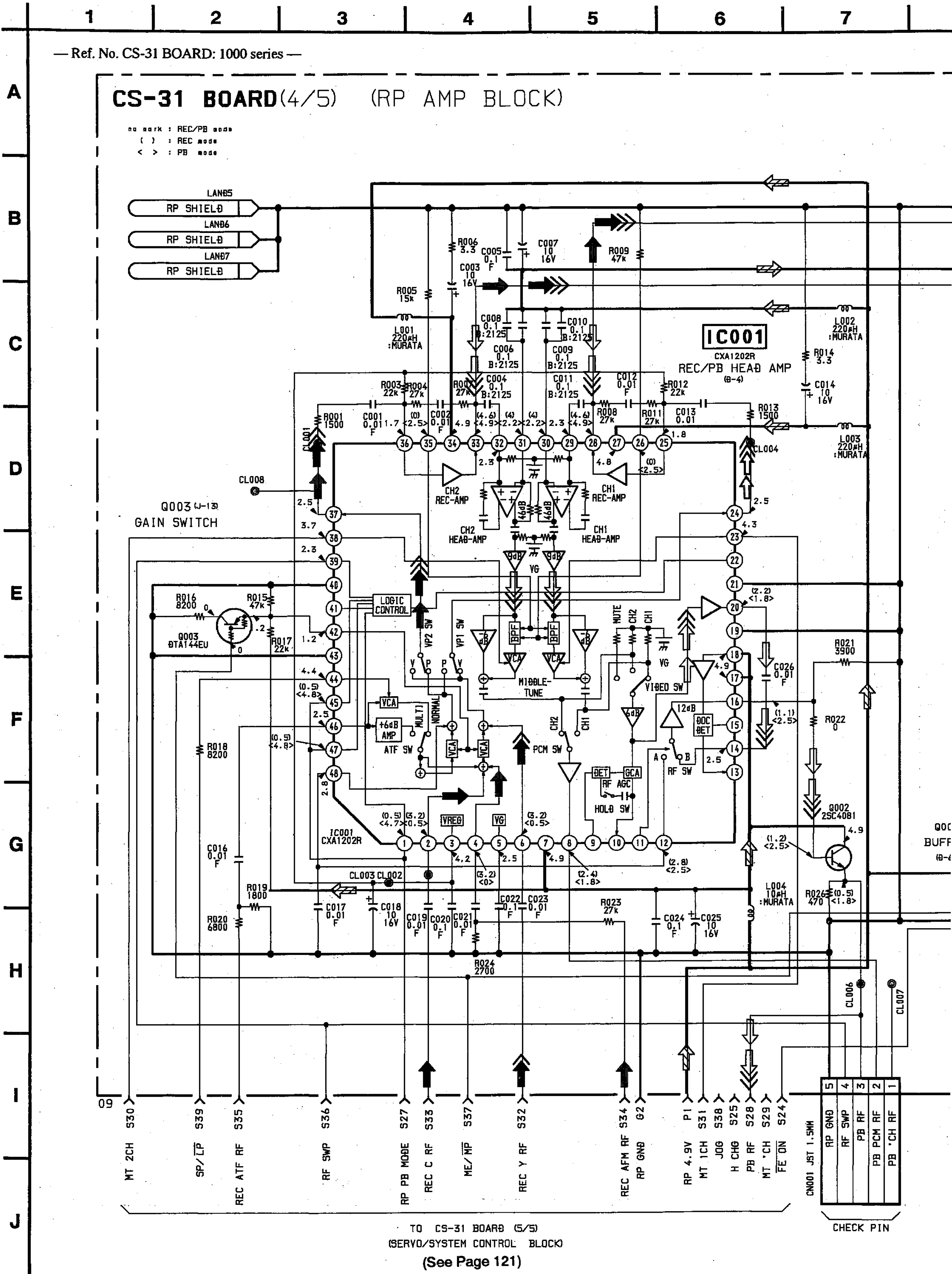
I

J

— Ref. No. CS-31 BOARD: 1000 series —


0.13Vp-p
0.22Vp-p
5Vp-p
PB

AUDIO SIGNAL
➡
⇨


1
2
3
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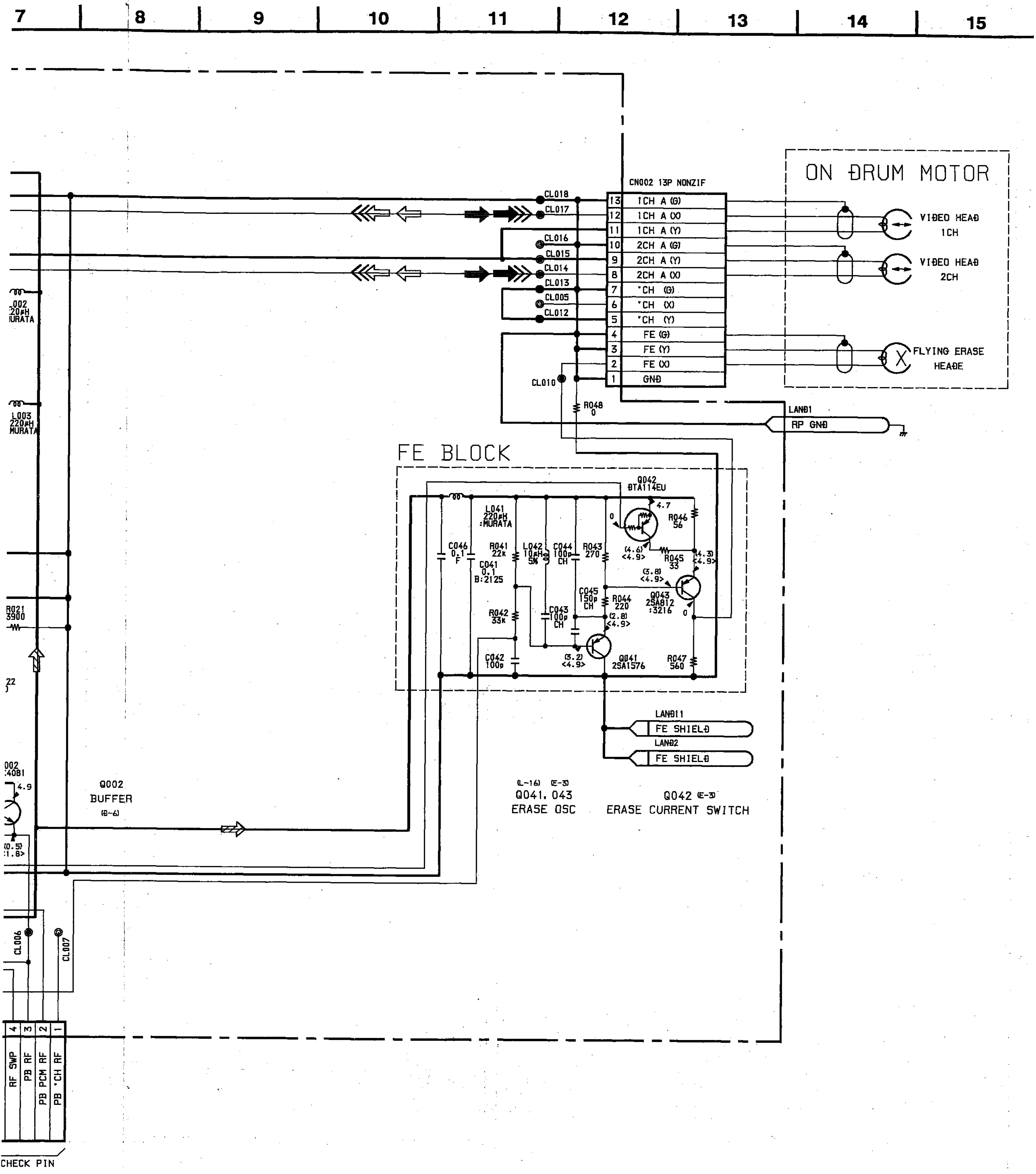
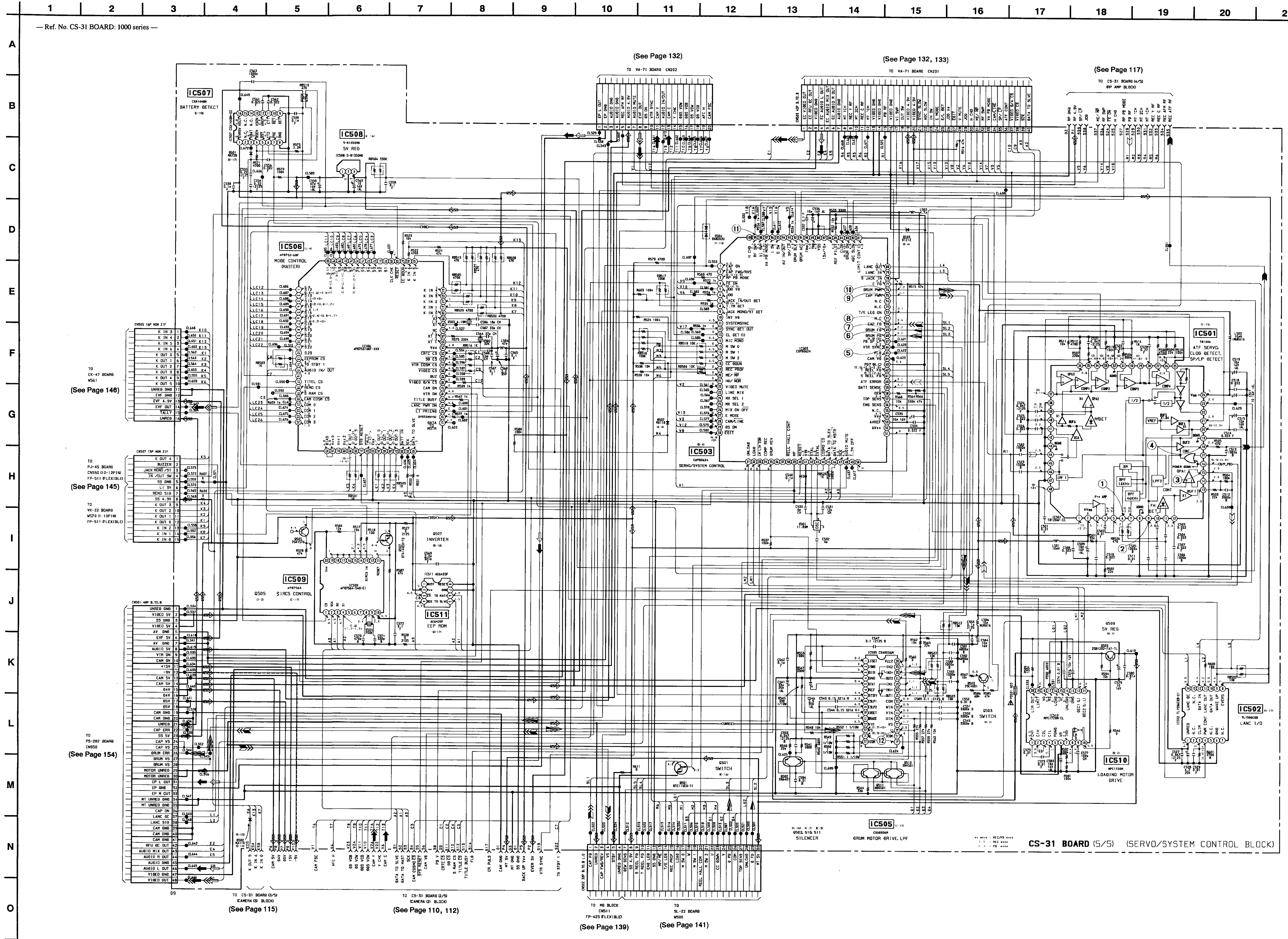
A
B
C
D
E
F
G
H
I
J
CS-31 BOARD(4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAND5
RP SHIELD
LAND6
RP SHIELD
LAND7
RP SHIELD
R006 3.3
C005 0.1 F
C007 10 16V
C003 10 16V
R009 47k
R005 15k
L001 220μH :MURATA
C008 0.1 B:2125
C010 0.1 B:2125
C006 0.1 B:2125
C009 0.1 B:2125
C004 0.1 B:2125
C011 0.1 B:2125
C012 0.01 F
IC001
CXA1202R
REC/PB HEAD AMP
(B-4)
L002 220μH :MURATA
R014 3.3
C014 10 16V
R003 22k
R004 27k
R007 27k
R008 27k
R011 27k
R012 22k
R013 1500
R001 1500
C001 0.01 F
C002 0.01 F
C013 0.01
L003 220μH :MURATA
CL001
CL004
CL008
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
46dB
9dB
VG
Q003 (J-13) GAIN SWITCH
R016 8200
R015 47k
R017 22k
Q003 DTA144EU
LOGIC CONTROL
VP2 SW
VP1 SW
V P P V
-6dB
BPF
VCA
MIDDLE-TUNE
MUTE
CH2
CH1
VIDEO SW
R021 3900
C026 0.01 F
R022 0
VCA
+6dB AMP
MULTI
NORMAL
ATF SW
PCM SW
12dB
DOC DET
DET
GCA
RF AGC
HOLD SW
RF SW
A B
Q002 2SC4081
BUFF
R018 8200
C016 0.01 F
R019 1800
R020 6800
IC001 CXA1202R
VREG
VG
CL003
CL002
C017 0.01 F
C018 10 16V
C019 0.01 F
C020 0.1 F
C021 0.01 F
C022 0.1 F
C023 0.01 F
R024 2700
R023 27k
C024 0.1 F
C025 10 16V
L004 10μH :MURATA
R026 470
CL006
CL007
09
S30 MT 2CH
S39 SP/LP
S35 REC ATF RF
S36 RF SWP
S27 RP PB MODE
S33 REC C RF
S37 ME/MP
S32 REC Y RF
S34 REC AFM RF
G2 RP GND
P1 RP 4.9V
S31 MT 1CH
S38 JOG
S25 H CHG
S28 PB RF
S29 MT 'CH
S24 FE ON
CN001 JST 1.5MM
5 RP GND
4 RF SWP
3 PB RF
2 PB PCM RF
1 PB 'CH RF
CHECK PIN
TO CS-31 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 121)


7
8
9
10
11
12
13
14
15
ON DRUM MOTOR
CN002 13P NONZIF
CL018
CL017
CL016
CL015
CL014
CL013
CL005
CL012
CL010
13 1CH A (G)
12 1CH A (X)
11 1CH A (Y)
10 2CH A (G)
9 2CH A (Y)
8 2CH A (X)
7 'CH (G)
6 'CH (X)
5 'CH (Y)
4 FE (G)
3 FE (Y)
2 FE (X)
1 GND
VIDEO HEAD 1CH
VIDEO HEAD 2CH
FLYING ERASE HEADE
R048 0
LAND1
RP GND
.002
20μH
URATA
L003
220μH
MURATA
R021
3900
22
002
:40B1
4.9
(0.5)
:1.8>
Q002
BUFFER
(B-6)
FE BLOCK
Q042
DTA114EU
4.7
0
R046 56
(4.6)
<4.9>
R045 33
(4.3)
<4.9>
(3.8)
<4.9>
Q043
2SA812
:3216
0
L041
220μH
:MURATA
C046
0.1
F
R041
22k
C041
0.1
B:2125
L042
10μH
5%
C044
100p
CH
R043
270
C045
150p
CH
R044
220
(2.8)
<4.9>
R042
33k
C043
100p
CH
C042
100p
(3.2)
<4.9>
Q041
2SA1576
R047
560
LAND11
FE SHIELD
LAND2
FE SHIELD
(L-16) (E-3)
Q041, 043
ERASE OSC
Q042 (E-3)
ERASE CURRENT SWITCH
CL006
CL007
4
3
2
1
RF SWP
PB RF
PB PCM RF
PB 'CH RF
CHECK PIN

CS-31 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

- Refer to page 102 for Printed Wiring Board.

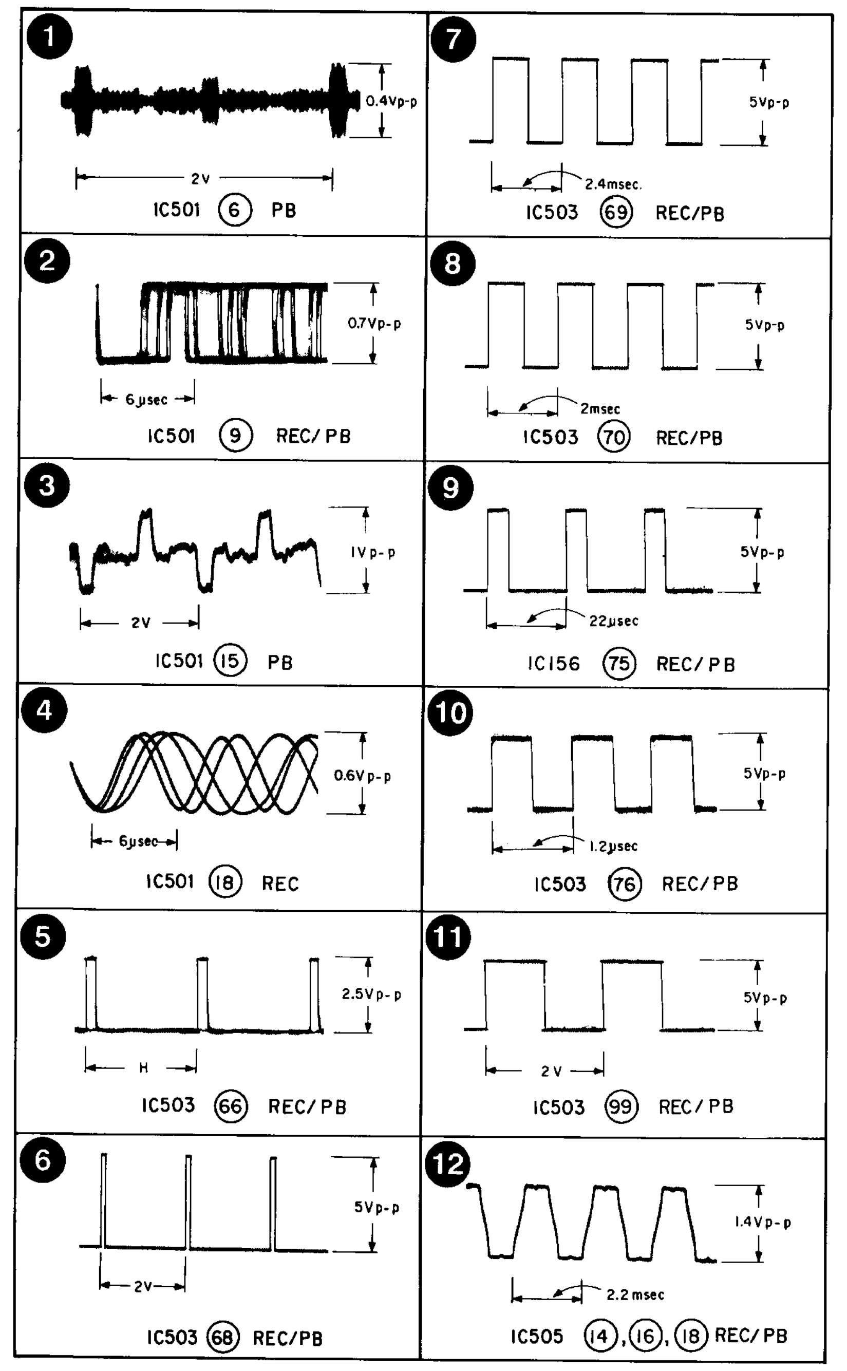

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
— Ref. No. CS-31 BOARD: 1000 series —
(See Page 132)
TO VA-71 BOARD CN202
(See Page 132, 133)
TO VA-71 BOARD CN201
(See Page 117)
TO CS-31 BOARD (4/5) RF AMP BLOCK
IC507
BATTERY DETECT
IC508
5V REG
IC506
MODE CONTROL (MASTER)
IC503
SERVO/SYSTEM CONTROL
IC501
ATF SERVO, CLOG DETECT, SP/LP DETECT
IC509
SIRCS CONTROL
Q505
Q507
INVERTER
IC511
EEP ROM
TO CK-47 BOARD
(See Page 148)
TO PJ-45 BOARD
(See Page 145)
TO VK-22 BOARD
TO PS-202 BOARD
(See Page 154)
Q501
SWITCH
Q509
5V REG
Q503
SWITCH
IC502
LANC I/O
IC510
LOADING MOTOR DRIVE
Q502, 510, 511
SILENCER
IC505
DRUM MOTOR DRIVE, LPF
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CS-31 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)
TO CS-31 BOARD (3/5) (CAMERA (1) BLOCK)
(See Page 115)
TO CS-31 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 110, 112)
TO MD BLOCK
(See Page 139)
TO SL-22 BOARD
(See Page 141)

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷›	
Drum servo (speed and phase)		▷››	
Capstan speed servo			
Capstan phase servo	➤»	➤»	▷»
Capstan servo (speed and phase)		➤»	
Ref. signal	➤	➤	▷

CS-31 BOARD (5/5)



(DIODE)

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D401	8-719-017-74	DIODE	MA8027-TX

(IC)

IC051	8-752-332-68	IC	CXL5502M-1-T3
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207AR-T5
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-055-82	IC	M62353GP
IC204	8-759-055-82	IC	M62353GP
IC205	8-759-636-33	IC	CXA1452
IC206	8-752-053-21	IC	CXA1211M
IC301	8-752-036-20	IC	CXA1208R
IC400	8-759-234-77	IC	TC4S66F
IC401	8-759-823-19	IC	CXA1488R-T4

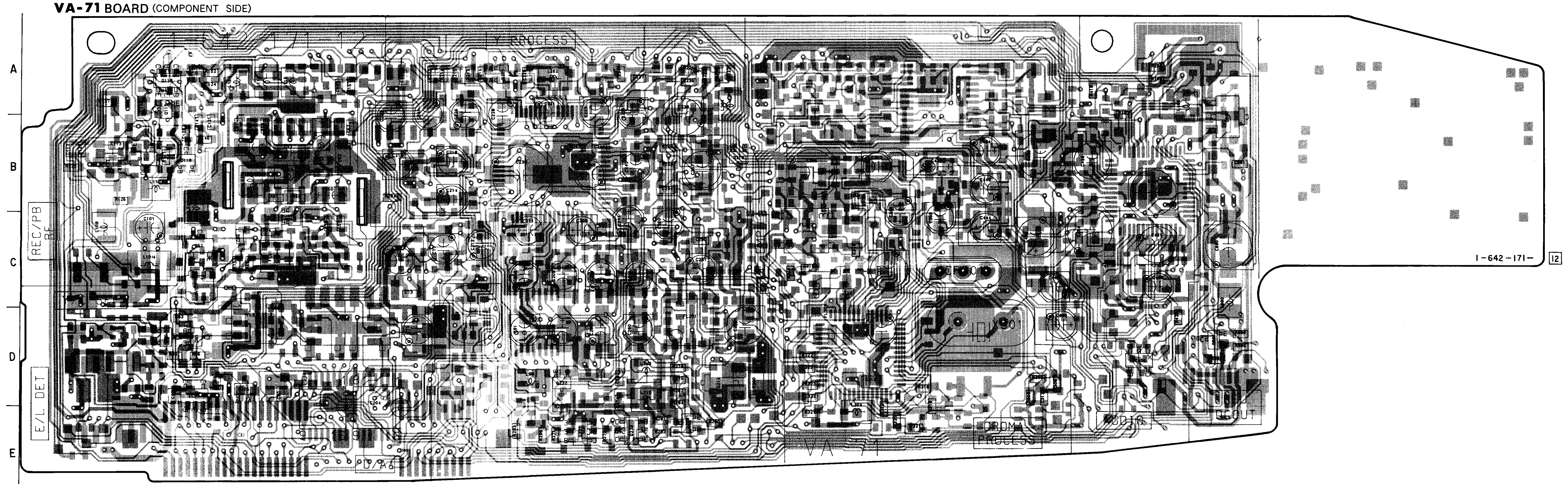
(TRANSISTOR)

Q051	8-729-920-48	TRANSISTOR	IMH2
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-905-23	TRANSISTOR	2SA1576-R
Q055	8-729-905-35	TRANSISTOR	2SC4081-R
Q057	8-729-905-35	TRANSISTOR	2SC4081-R
Q060	8-729-905-35	TRANSISTOR	2SC4081-R
Q061	8-729-905-35	TRANSISTOR	2SC4081-R
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-905-35	TRANSISTOR	2SC4081-R
Q065	8-729-905-35	TRANSISTOR	2SC4081-R
Q066	8-729-905-23	TRANSISTOR	2SA1576-R
Q067	8-729-905-96	TRANSISTOR	DTA114TU
Q103	8-729-905-35	TRANSISTOR	2SC4081-R
Q104	8-729-905-35	TRANSISTOR	2SC4081-R
Q110	8-729-920-XX	TRANSISTOR	DTA114EUT106
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13
Q114	8-729-905-35	TRANSISTOR	2SC4081-R
Q115	8-729-905-12	TRANSISTOR	DTA144EU
Q118	8-729-920-48	TRANSISTOR	IMH2
Q119	8-729-905-23	TRANSISTOR	2SA1576-R
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13
Q122	8-729-905-35	TRANSISTOR	2SC4081-R
Q202	8-729-905-23	TRANSISTOR	2SA1576-R
Q204	8-729-905-35	TRANSISTOR	2SC4081-R
Q213	8-729-905-18	TRANSISTOR	DTC144EU
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q215	8-729-905-35	TRANSISTOR	2SC4081-R
Q216	8-729-905-35	TRANSISTOR	2SC4081-R
Q217	8-729-905-12	TRANSISTOR	DTA144EU
Q218	8-729-402-81	TRANSISTOR	XN4501
Q220	8-729-905-35	TRANSISTOR	2SC4081-R
Q222	8-729-402-81	TRANSISTOR	XN4501
Q223	8-729-905-12	TRANSISTOR	DTA144EU
Q224	8-729-905-18	TRANSISTOR	DTC144EU
Q225	8-729-905-18	TRANSISTOR	DTC144EU
Q226	8-729-823-16	TRANSISTOR	2SC4555-5. 6. 7
Q227	8-729-920-48	TRANSISTOR	IMH2
Q228	8-729-905-35	TRANSISTOR	2SC4081-R
Q229	8-729-905-35	TRANSISTOR	2SC4081-R
Q230	8-729-905-23	TRANSISTOR	2SA1576-R
Q232	8-729-905-23	TRANSISTOR	2SA1576-R
Q233	8-729-925-42	TRANSISTOR	IMT2
Q235	8-729-905-23	TRANSISTOR	2SA1576-R
Q302	8-729-402-81	TRANSISTOR	XN4501
Q304	8-729-905-12	TRANSISTOR	DTA144EU
Q306	8-729-905-35	TRANSISTOR	2SC4081-R
Q307	8-729-905-35	TRANSISTOR	2SC4081-R
Q308	8-729-905-23	TRANSISTOR	2SA1576-R
Q309	8-729-905-35	TRANSISTOR	2SC4081-R
Q310	8-729-905-18	TRANSISTOR	DTC144EU
Q311	8-729-905-23	TRANSISTOR	2SA1576-R
Q312	8-729-420-20	TRANSISTOR	XN4312
Q313	8-729-905-12	TRANSISTOR	DTA144EU
Q314	8-729-905-35	TRANSISTOR	2SC4081-R
Q318	8-729-905-18	TRANSISTOR	DTC144EU
Q319	8-729-905-18	TRANSISTOR	DTC144EU
Q401	8-729-921-08	TRANSISTOR	DTC144TU
Q402	8-729-905-18	TRANSISTOR	DTC144EU
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q991	8-729-905-35	TRANSISTOR	2SC4081-R

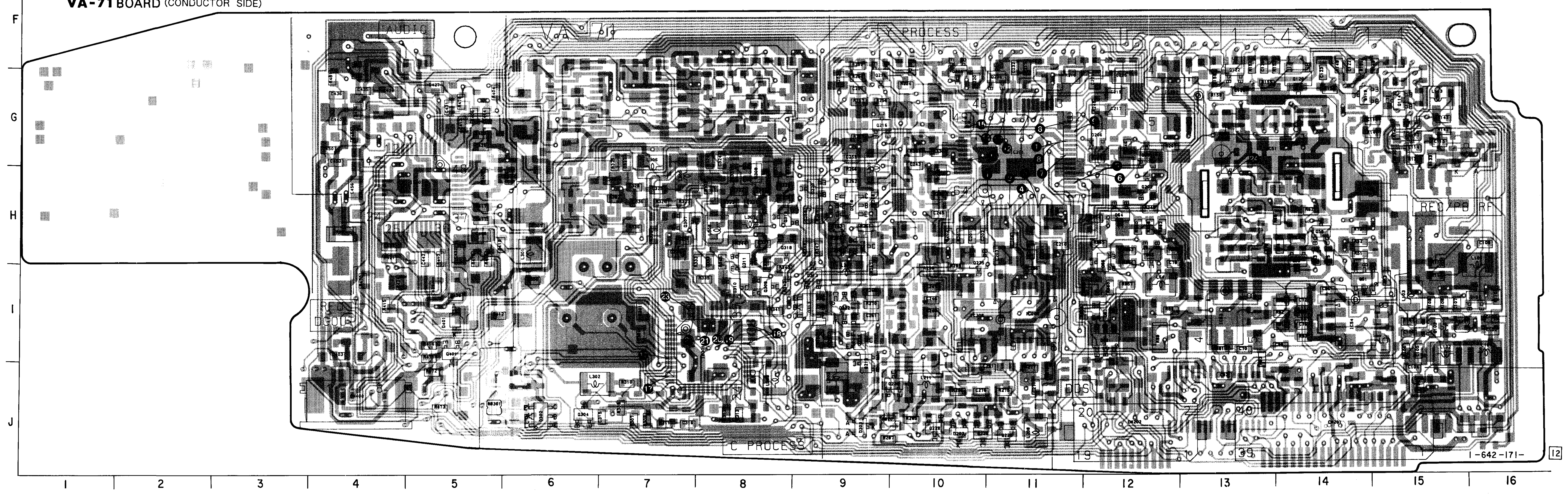
VA-71 (VIDEO, AUDIO) PRINTED WIRING BOARD

— Ref. No. VA-71 BOARD: 2000 series —

VA-71 BOARD (COMPONENT SIDE)



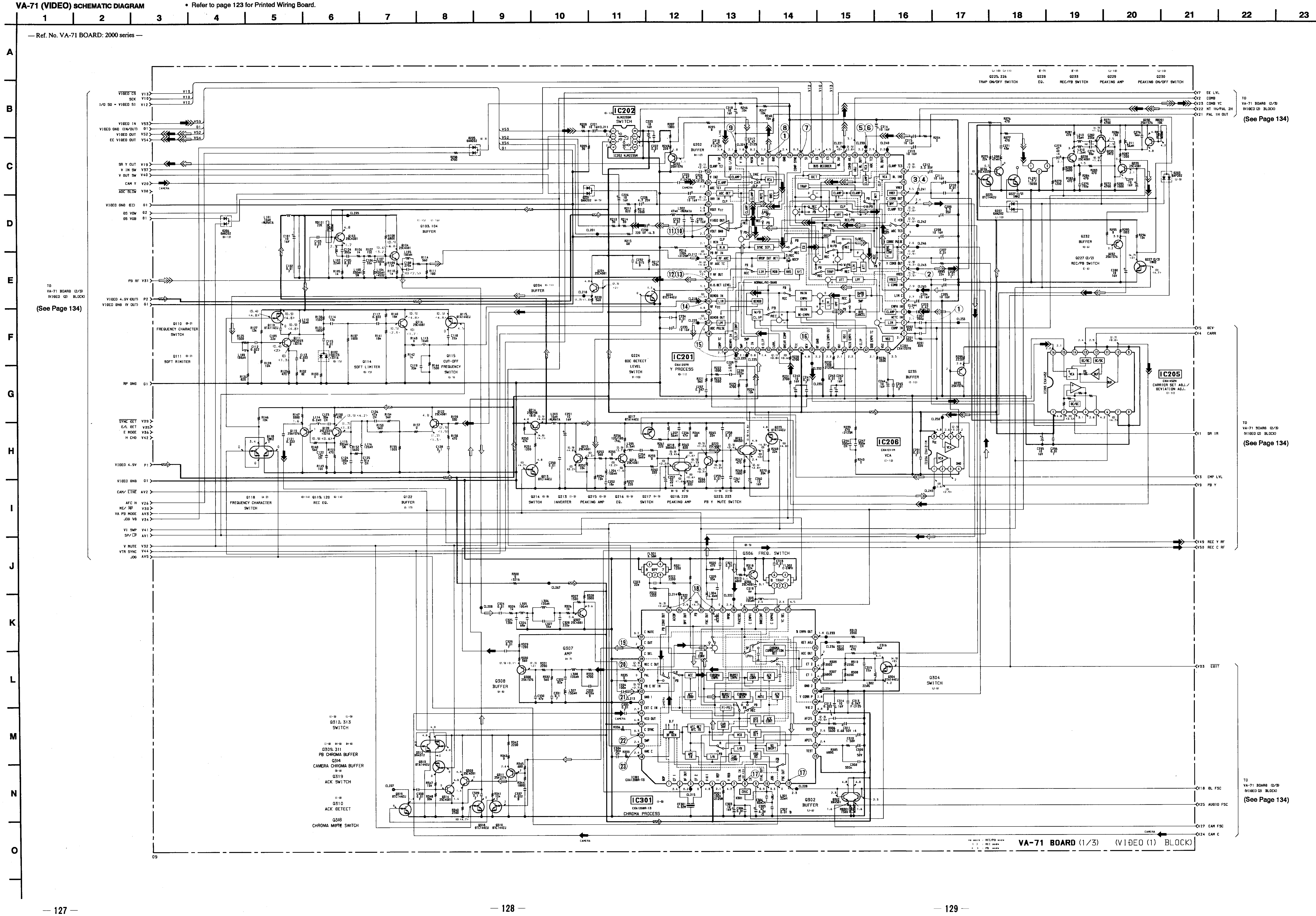
VA-71 BOARD (CONDUCTOR SIDE)



VA-71 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 123 for Printed Wiring Board.

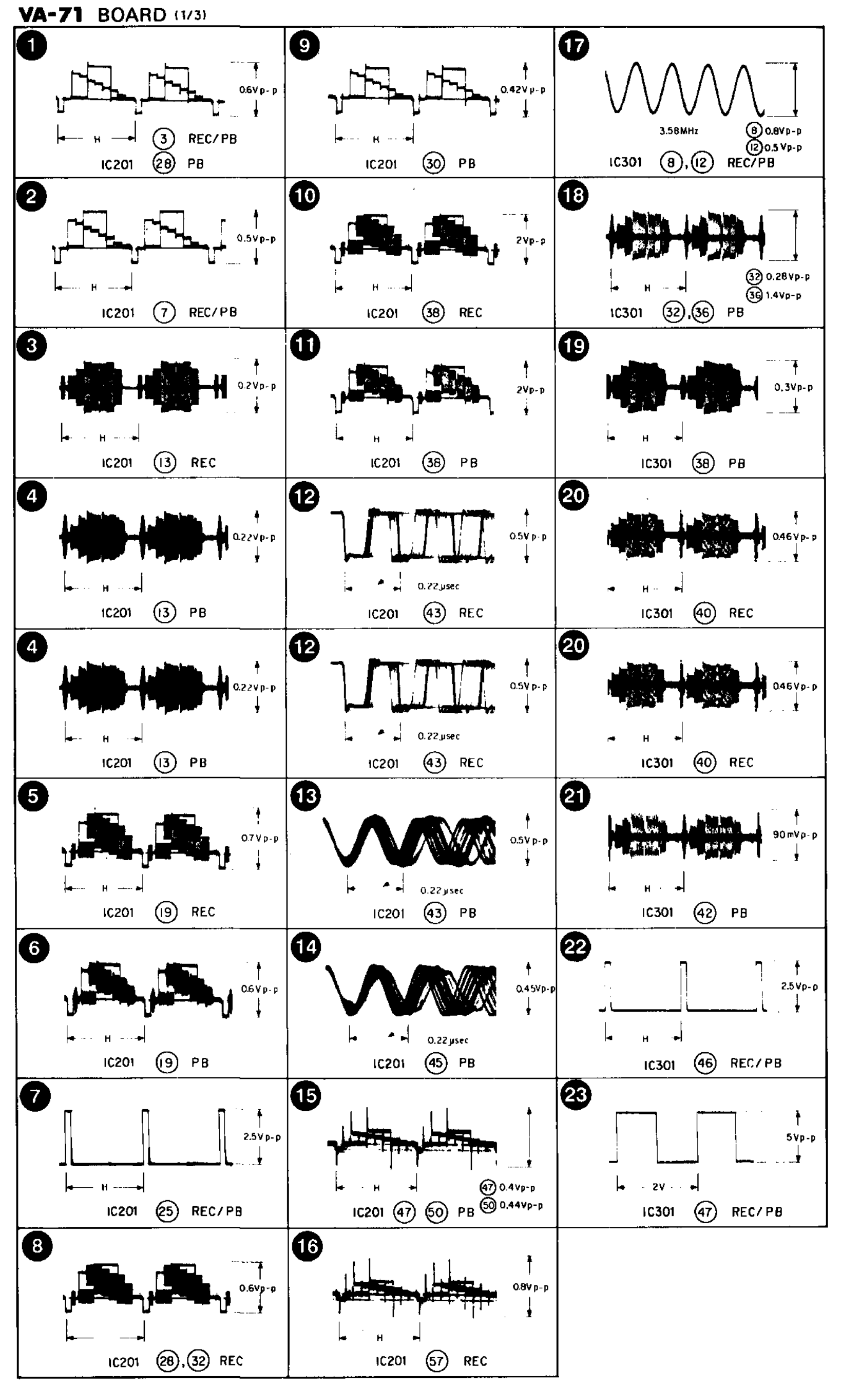
— Ref. No. VA-71 BOARD: 2000 series —



VIDEO CS V13
SCK V10
I/O SO - VIDEO SI V12
VIDEO IN V53
VIDEO GND (IN/OUT) G1
VIDEO OUT V52
EC VIDEO OUT V54
SR Y OUT V19
V IN SW V37
V OUT SW V40
CAM Y V20
CAMERA
AGC SLOW V38
VIDEO GND (EC) G1
DS VOW D2
DS VOB D1
PB RF V31
VIDEO 4.9V (OUT) P2
VIDEO GND (V OUT) G1
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 134)
Q110 FREQUENCY CHARACTER SWITCH
Q111 SOFT RIMITER
RP GND G1
SYNC DET V39
E/L DET V35
E MODE V36
H CHG V42
VIDEO 4.9V P1
VIDEO GND G1
CAM/LINE AV2
AFC H V26
ME/MP V30
VA PB MODE AV3
JOG VD V34
VI SWP V41
SP/LP AV1
V MUTE V32
VTR SYNC V44
JOG AV5
IC202 SWITCH
IC201 Y PROCESS
IC205 CXA1452N CARRIER SET ADJ./ DEVIATION ADJ.
IC206 VCA
IC301 CHROMA PROCESS
Q230 PEAKING ON/OFF SWITCH
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL 2H
V21 PAL 1H OUT
V5 DEV
V4 CARR
V1 SR 1R
V3 EMP LVL
V9 PB Y
V49 REC Y RF
V50 REC C RF
V33 EGIT
V18 DL FSC
V25 AUDIO FSC
V27 CAM FSC
V24 CAM C
Q506 FREQ. SWITCH
Q507 AMP
Q508 BUFFER
Q504 SWITCH
Q502 BUFFER
Q312, 313 SWITCH
Q305, 311 PB CHROMA BUFFER
Q316 CAMERA CHROMA BUFFER
Q319 ACK SWITCH
Q310 ACK DETECT
Q318 CHROMA MUTE SWITCH
VA-71 BOARD (1/3) (VIDEO (1) BLOCK)

- SIGNAL PATH

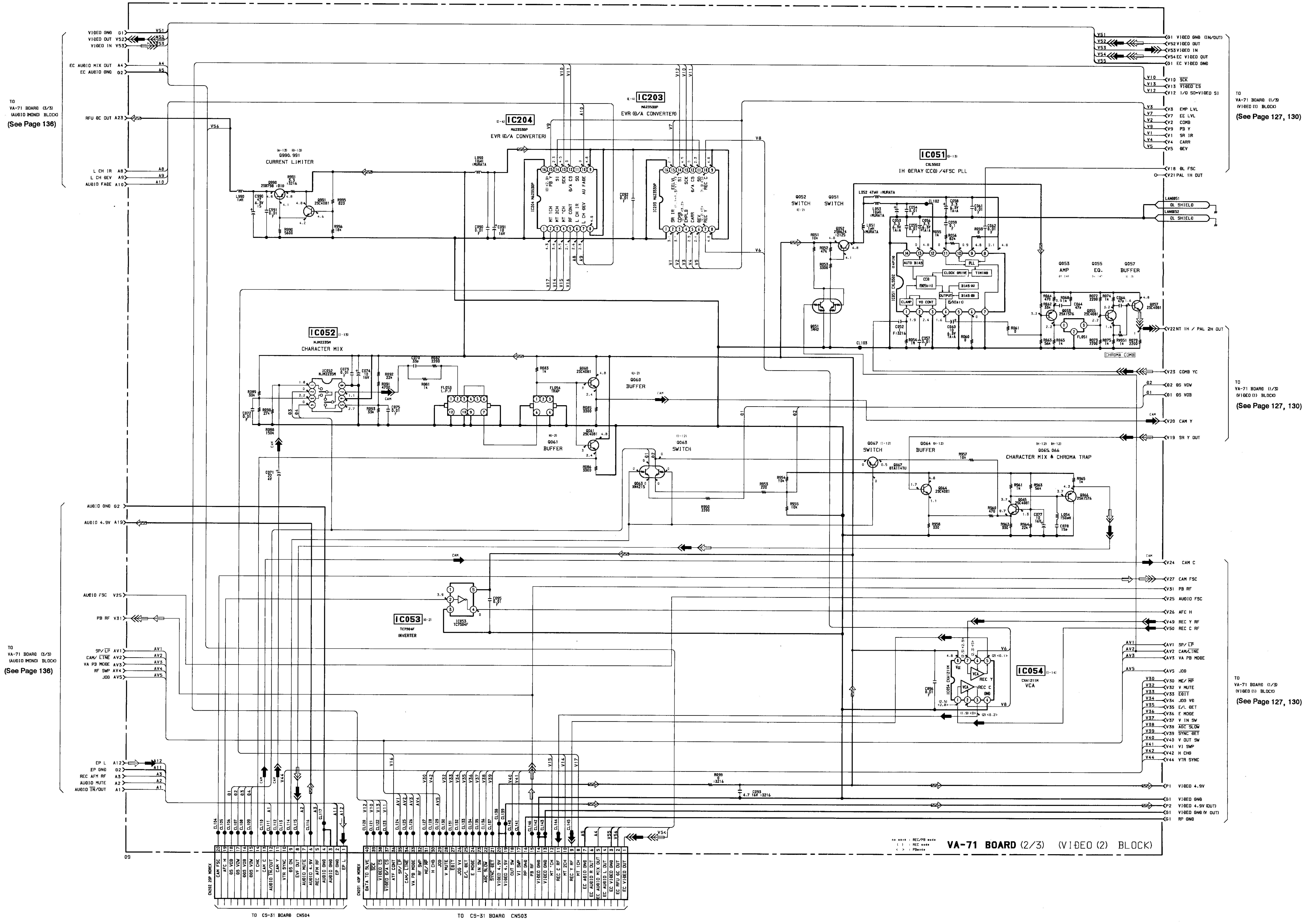
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	
PB	⇨	⇨»	⇨»»	



VA-71 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 123 for Printed Wiring Board.

— Ref. No. VA-71 BOARD: 2000 series —

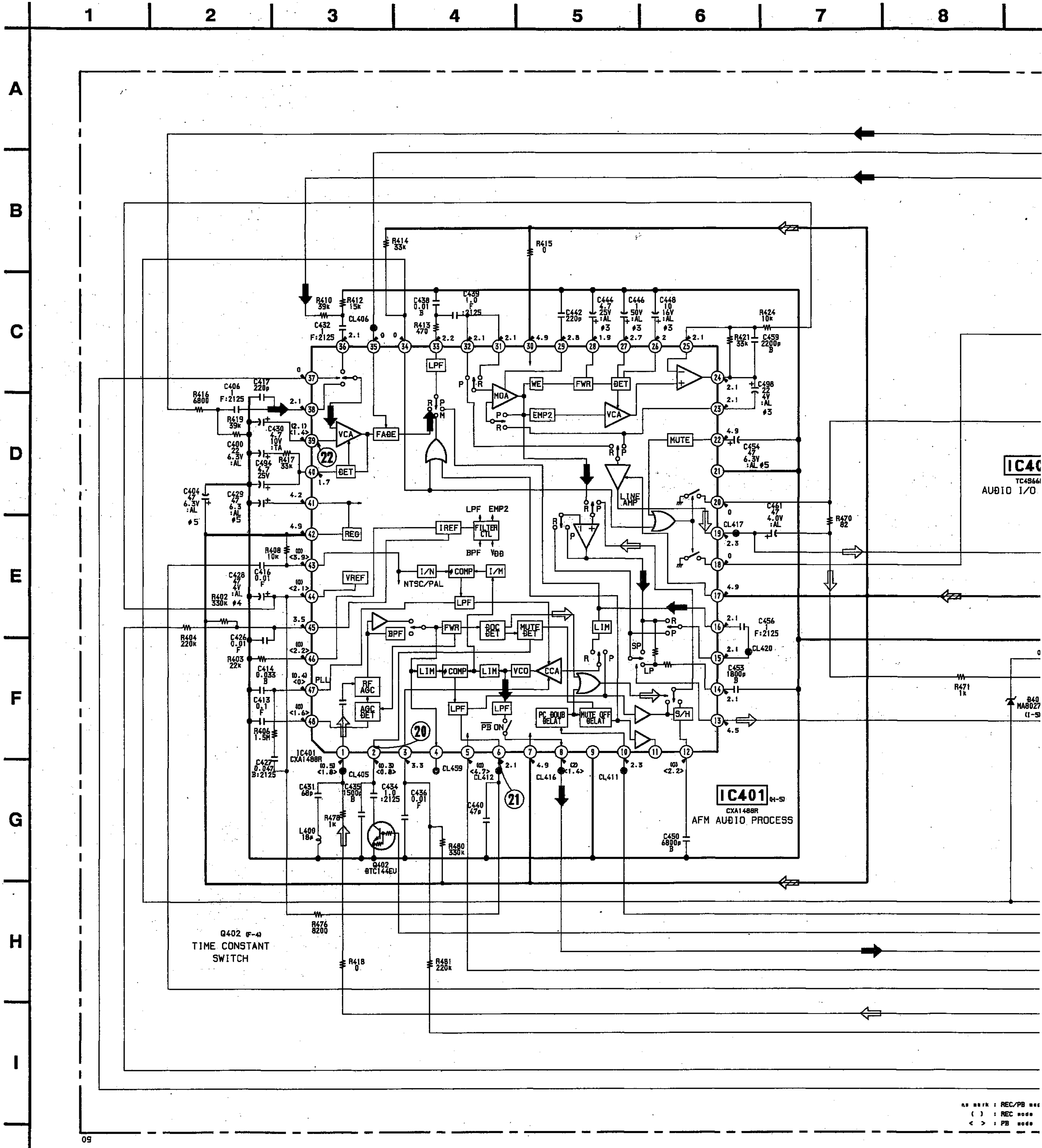

VIDEO GND G1
VIDEO OUT V52
VIDEO IN V53
EC AUDIO MIX OUT A4
EC AUDIO GND G2
TO
VA-71 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 136)
RFU DC OUT A23
L CH IR A8
L CH DEV A9
AUDIO FADE A10
Q990, 991
CURRENT LIMITER
IC204
EVR (D/A CONVERTER)
IC203
EVR (D/A CONVERTER)
IC051
1H DELAY (CCD)/4FSC PLL
Q052
SWITCH
Q051
SWITCH
Q053
AMP
Q055
EQ.
Q057
BUFFER
IC052
CHARACTER MIX
Q060
BUFFER
Q061
BUFFER
Q063
SWITCH
Q067
SWITCH
Q064
BUFFER
Q065, 066
CHARACTER MIX & CHROMA TRAP
CHROMA COMB
AUDIO GND G2
AUDIO 4.9V A19
AUDIO FSC V25
PB RF V31
IC053
INVERTER
SP/LP AV1
CAM/LINE AV2
VA PB MODE AV3
RF SWP AV4
JOG AV5
TO
VA-71 BOARD (3/3)
(AUDIO (MONO) BLOCK)
(See Page 136)
IC054
VCA
EP L A12
EP GND G2
REC AFM RF A3
AUDIO MUTE A2
AUDIO IN/OUT A1
G1 VIDEO GND (IN/OUT)
V52 VIDEO OUT
V53 VIDEO IN
V54 EC VIDEO OUT
G1 EC VIDEO GND
V10 SCK
V13 VIDEO CS
V12 I/O SO=VIDEO SI
V3 EMP LVL
V7 EE LVL
V2 COMB
V9 PB Y
V1 SR IR
V4 CARR
V5 DEV
V18 DL FSC
V21 PAL 1H OUT
TO
VA-71 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 127, 130)
LAN0051
DL SHIELD
LAN0052
DL SHIELD
V22 NT 1H / PAL 2H OUT
V23 COMB YC
D2 DS VOW
D1 DS VOB
V20 CAM Y
V19 SR Y OUT
TO
VA-71 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 127, 130)
V24 CAM C
V27 CAM FSC
V31 PB RF
V25 AUDIO FSC
V26 AFC H
V49 REC Y RF
V50 REC C RF
AV1 SP/LP
AV2 CAM/LINE
AV3 VA PB MODE
AV5 JOG
V30 ME/MP
V32 V MUTE
V33 EDIT
V34 JOG Vd
V35 E/L DET
V36 E MODE
V37 Y IN SW
V38 AGC SLOW
V39 SYNC DET
V40 Y OUT SW
V41 VI SWP
V42 H CHG
V44 VTR SYNC
TO
VA-71 BOARD (1/3)
(VIDEO (1) BLOCK)
(See Page 127, 130)
P1 VIDEO 4.9V
G1 VIDEO GND
P2 VIDEO 4.9V (OUT)
G1 VIDEO GND (V OUT)
G1 RP GND
no mark : REC/PB mode
( ) : REC mode
< > : PBmode
VA-71 BOARD (2/3) (VIDEO (2) BLOCK)
CN202 20P MOREX
20 CAM FSC
19 AFC H
18 DS VOB
17 DS VOW
16 DDS VOB
15 DDS VOW
14 Y CHK
13 CAM C
12 AUDIO IN/OUT
11 CAM Y
10 VTR SYNC
9 DS ON
8 EVF OUT
7 AUDIO MUTE
6 AUDIO 4.9V
5 REC AFM RF
4 AUDIO GND
3 AUDIO GND
2 EP GND
1 EP L
TO CS-31 BOARD CN504
CN201 40P MOREX
40 DATA TO SLVE
39 SCK
38 VIDEO CS
37 VIDEO D/A CS
36 ATF CONT
35 SP/LP
34 CAM/LINE
33 VA PB MODE
32 RF SWP
31 ME/MP
30 H CHG
29 JOG
28 V MUTE
27 EDIT
26 JOG Vd
25 E/L DET
24 E MODE
23 IN SW
22 AGC SLOW
21 SYNC DET
20 VIDEO 4.9V
19 VIDEO 4.9V
18 OUT SW
17 VI SWP
16 RP GND
15 PB RF
14 VIDEO GND
13 VIDEO GND
12 MT 'CH
11 REC C RF
10 MT 2CH
9 REC Y RF
8 MT 1CH
7 EC AUDIO GND
6 EC AUDIO R OUT
5 EC AUDIO MIX OUT
4 EC AUDIO L OUT
3 EC VIDEO GND
2 EC RFU DC OUT
1 EC VIDEO OUT
TO CS-31 BOARD CN503

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	➡
PB	⇨	⇨≫	⇨⋙	⇨

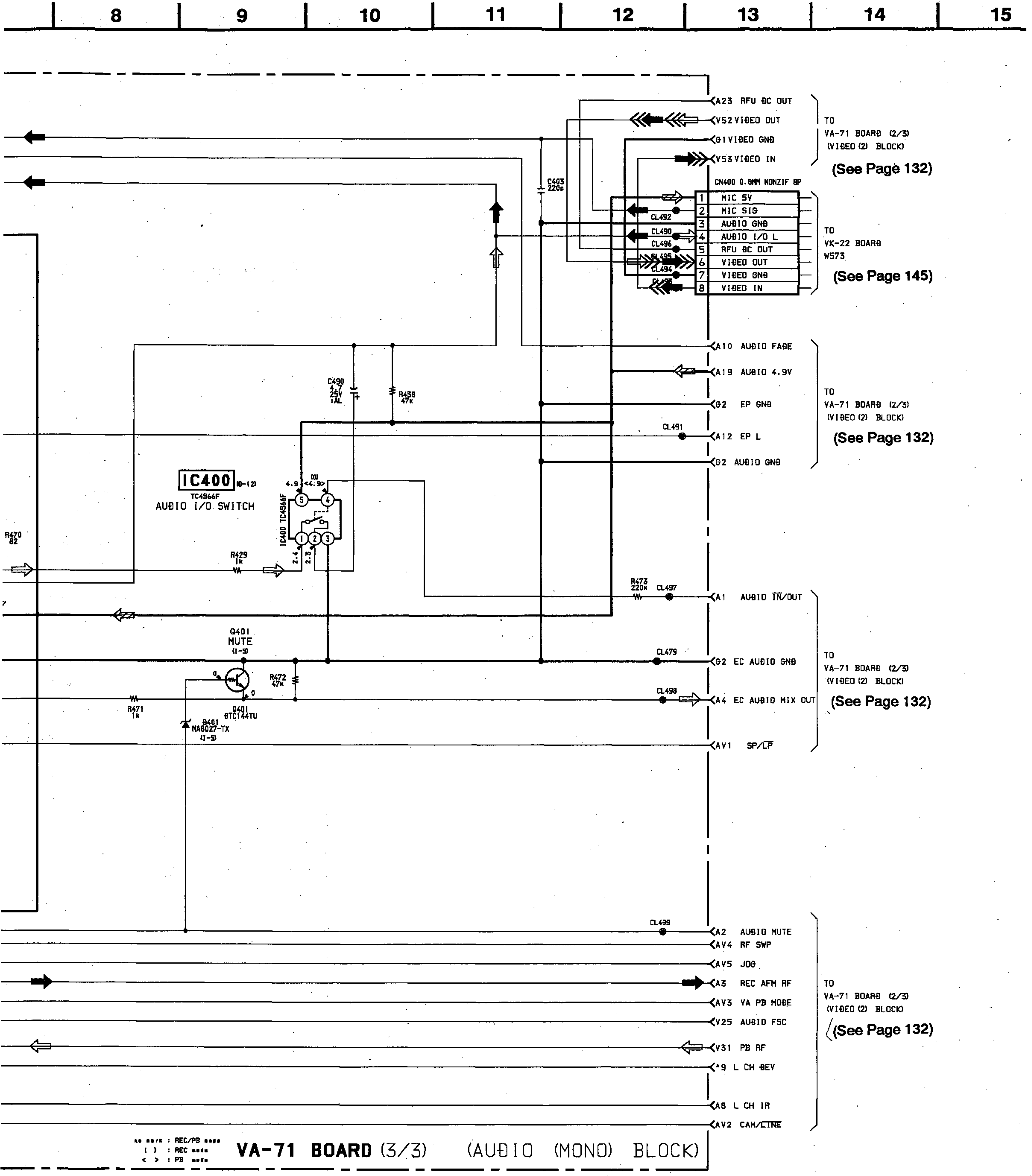
VA-71 (AUDIO) SCHEMATIC DIAGRAM

- Refer to page 123 for Printed Wiring Board.


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
IC401 (H-5)
CXA1488R
AFM AUDIO PROCESS
IC40
AUDIO I/O
Q402 (F-4)
TIME CONSTANT
SWITCH
Q402
DTC144EU
VCA
FADE
DET
REG
VREF
IREF
FILTER CTL
LPF
EMP2
BPF
VDD
I/N
NTSC/PAL
φCOMP
I/M
FWR
DOC DET
MUTE DET
RF AGC
AGC DET
LIM
VCO
CCA
PLL
PC DOUB DELAT
MUTE OFF DELAT
PB ON
S/H
MOA
WE
MUTE
LINE AMP
SP
LP
R410 39k
R412 15k
R414 33k
R415 0
R413 470
R416 6800
R419 39k
R417 33k
R408 10k
R402 330k
R404 220k
R403 22k
R406 1.5M
R478 1k
R480 330k
R476 8200
R418 0
R481 220k
R424 10k
R421 33k
R470 82
R471 1k
C406 F:2125
C417 220p
C432 F:2125
C438 0.01 B
C439 1.0 F :2125
C442 220p
C444 4.7 25V :AL
C446 1 50V :AL
C448 10 16V :AL
C459 2200p B
C498 22 4V :AL
C430 4.7 10V :TA
C400 22 6.3V :AL
C494 4.7 25V
C404 47 6.3V :AL
C429 47 6.3 :AL
C428 47 4V :AL
C416 0.01 F
C426 0.01 F
C414 0.033 B
C413 0.1 F
C427 0.047 B:2125
C431 68p
C435 1500p B
C434 1.0 :2125
C436 0.01 F
C440 47p
C450 6800p B
C454 47 6.3V :AL
C461 47 4.0V :AL
C456 F:2125
C453 1800p B
L400 18μ
CL405
CL406
CL412
CL416
CL411
CL417
CL420
CL459
D
MA8027 (I-5)
20
21
22
no mark : REC/PB mod
( ) : REC mode
< > : PB mode
09

• SIGNAL PAT

	CHROI
REC	
PB	


8
9
10
11
12
13
14
15
A23 RFU DC OUT
V52 VIDEO OUT
G1 VIDEO GND
V53 VIDEO IN
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 132)
CN400 0.8MM NONZIF 8P
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
CL492
CL490
CL496
CL495
CL494
CL493
TO
VK-22 BOARD
W573
(See Page 145)
C403
220p
A10 AUDIO FADE
A19 AUDIO 4.9V
G2 EP GND
A12 EP L
G2 AUDIO GND
CL491
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 132)
C490
4.7
25V
:AL
R458
47k
IC400 (B-12)
TC4966F
AUDIO I/O SWITCH
IC400 TC4966F
4.9
(0)
<4.9>
2.4
2.3
R470
82
R429
1k
R473
220k
CL497
A1 AUDIO IN/OUT
Q401
MUTE
(I-5)
R472
47k
CL479
G2 EC AUDIO GND
CL498
A4 EC AUDIO MIX OUT
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 132)
R471
1k
Q401
DTC144TU
D401
MA8027-TX
(I-5)
AV1 SP/LP
CL499
A2 AUDIO MUTE
AV4 RF SWP
AV5 JOG
A3 REC AFM RF
AV3 VA PB MODE
V25 AUDIO FSC
V31 PB RF
A9 L CH DEV
A8 L CH IR
AV2 CAM/LINE
TO
VA-71 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 132)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
VA-71 BOARD (3/3) (AUDIO (MONO) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

SL-22 (MECH DRIVE) PRINTED WIRING BOAR

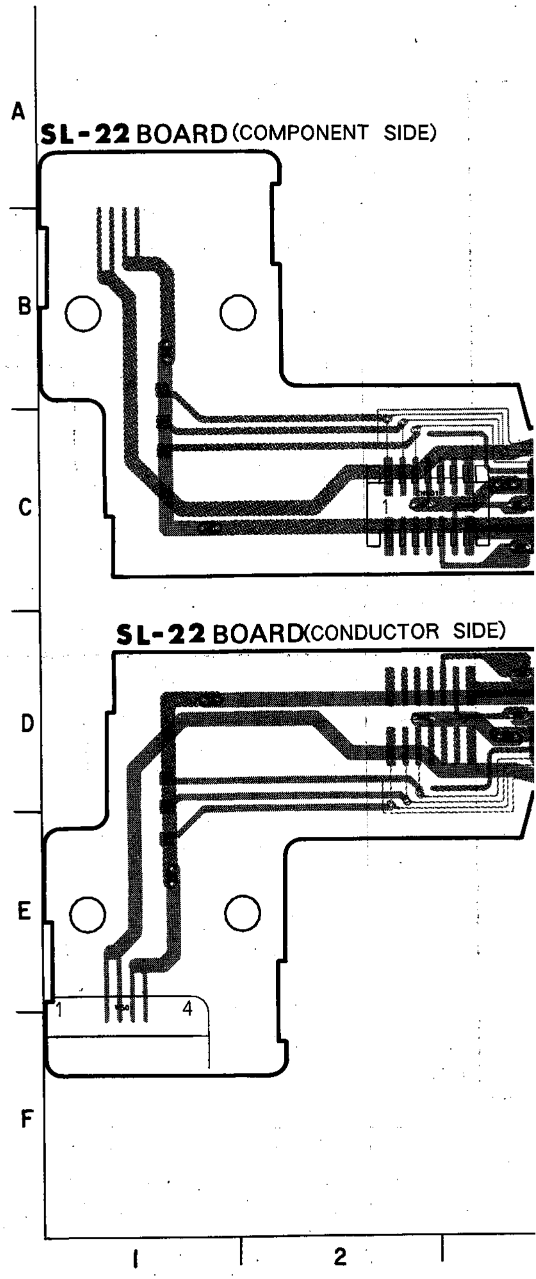
— Ref. No. SL-22 BOARD: 3000 series —

〈 IC 〉

IC501 8-759-059-09 IC LB8111V-TE-L

〈 TRANSISTOR 〉

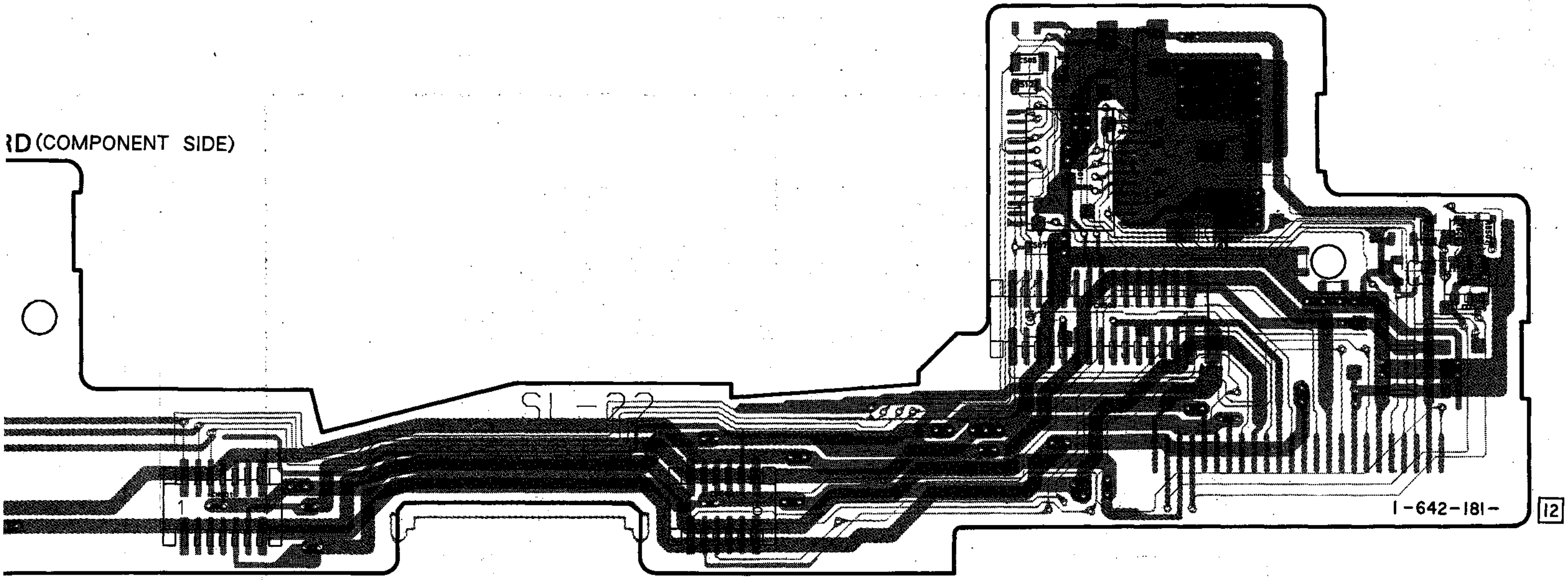
Q501 8-729-402-81 TRANSISTOR XN4501


A
SL-22 BOARD (COMPONENT SIDE)
B
C
1
SL-22 BOARD(CONDUCTOR SIDE)
D
E
1
4
F
1
2

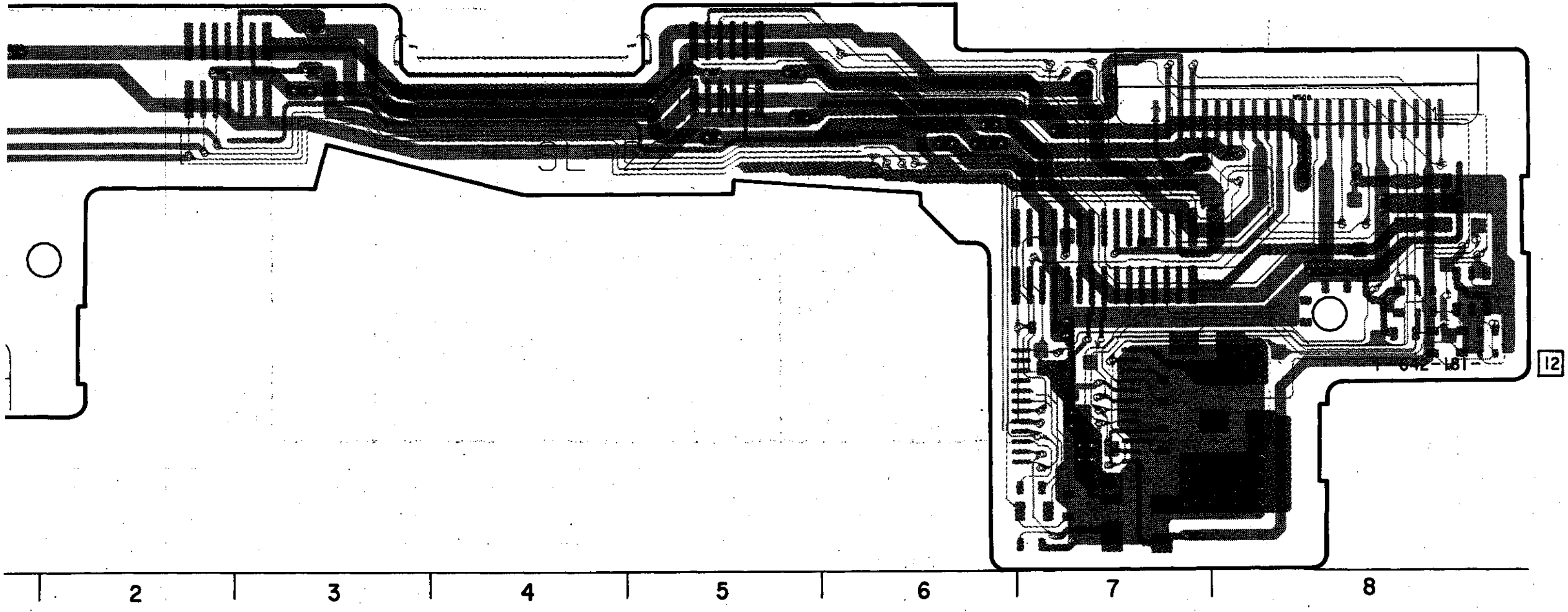
RIVE) PRINTED WIRING BOARD

ARD: 3000 series —

RD (COMPONENT SIDE)

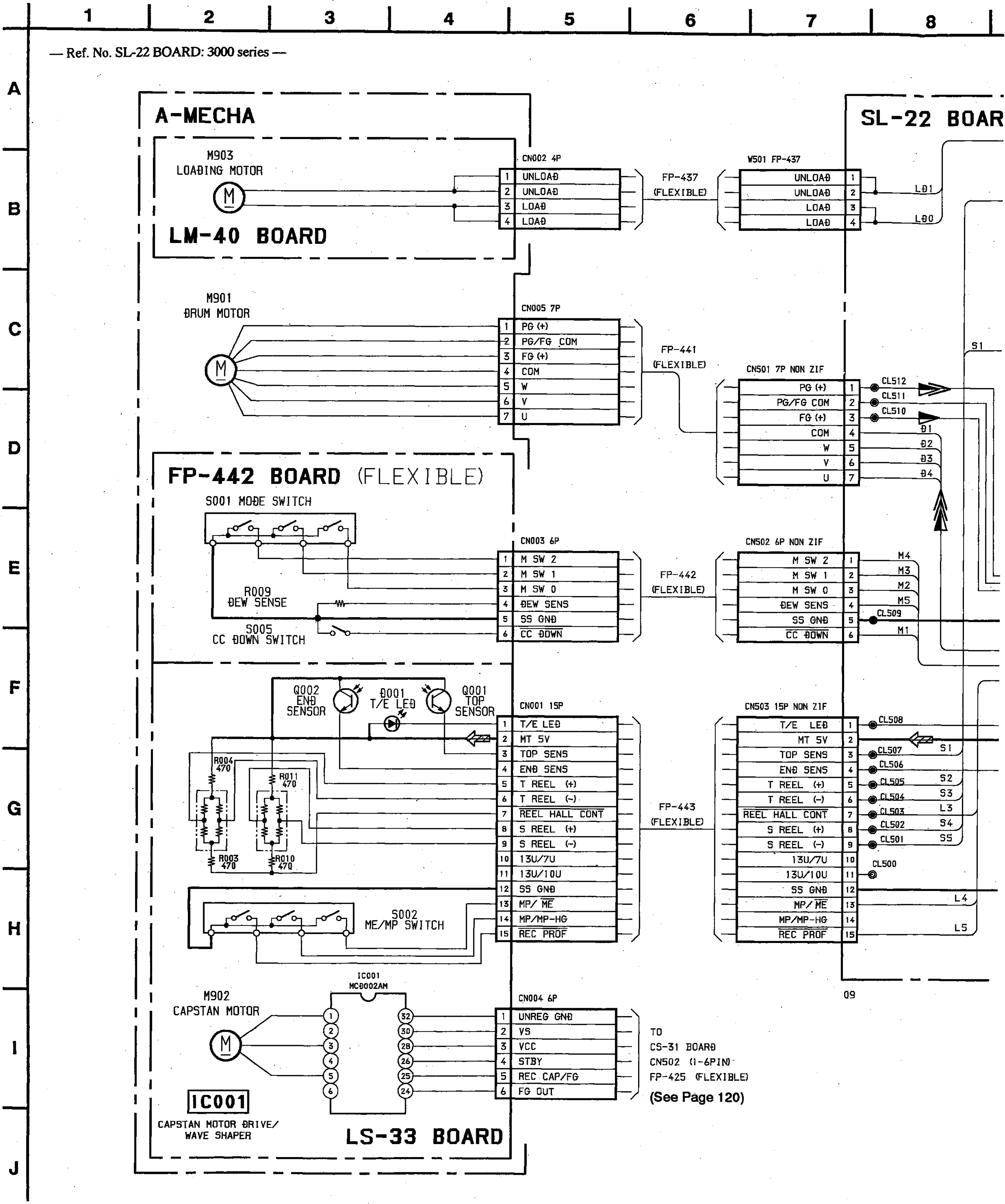

SL-22
1
1-642-181-
12

BOARD (CONDUCTOR SIDE)


SL-22
1-642-181-
12
2
3
4
5
6
7
8

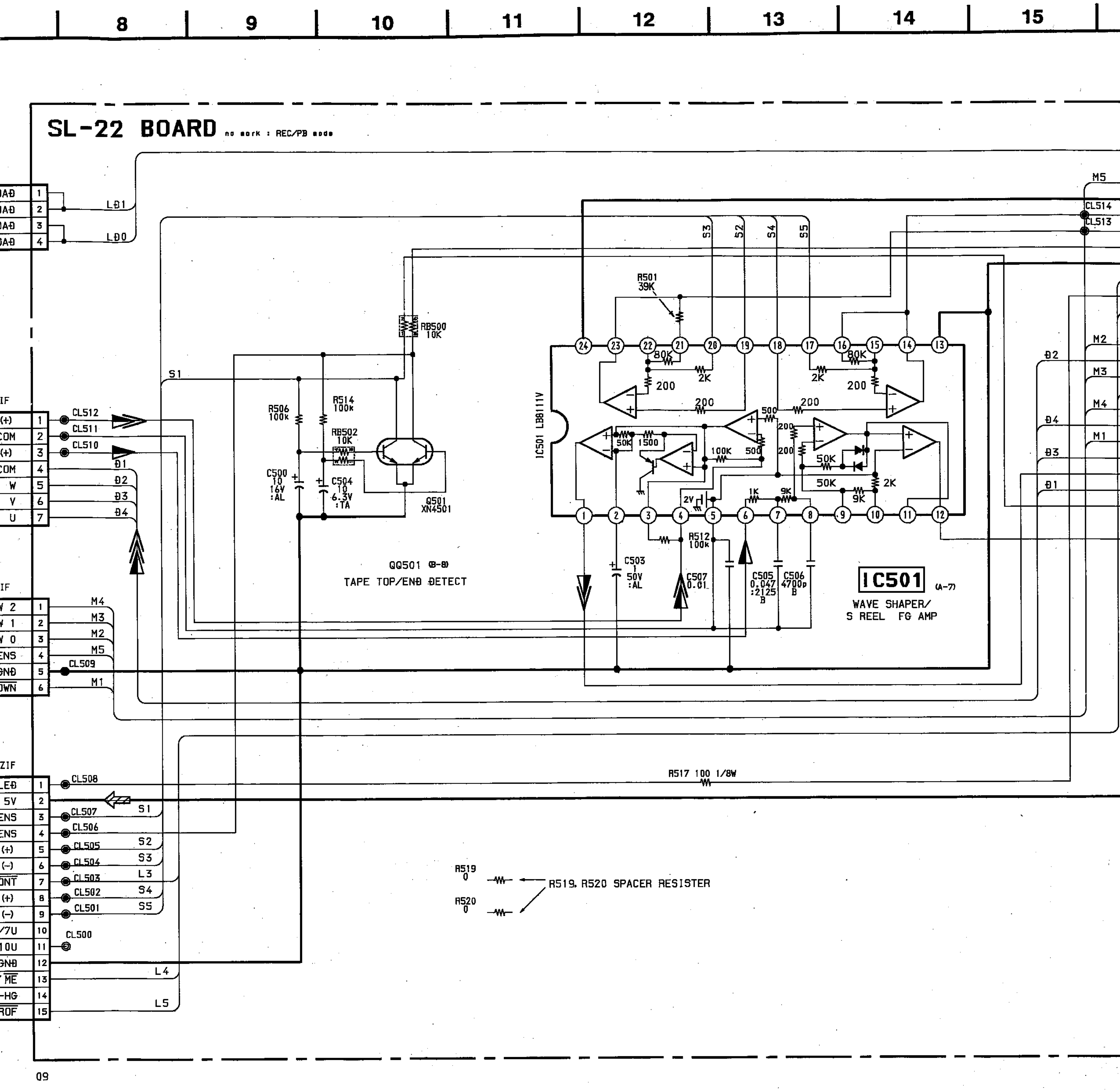
SL-22 (MECH DRIVE) SCHEMATIC DIAGRAM

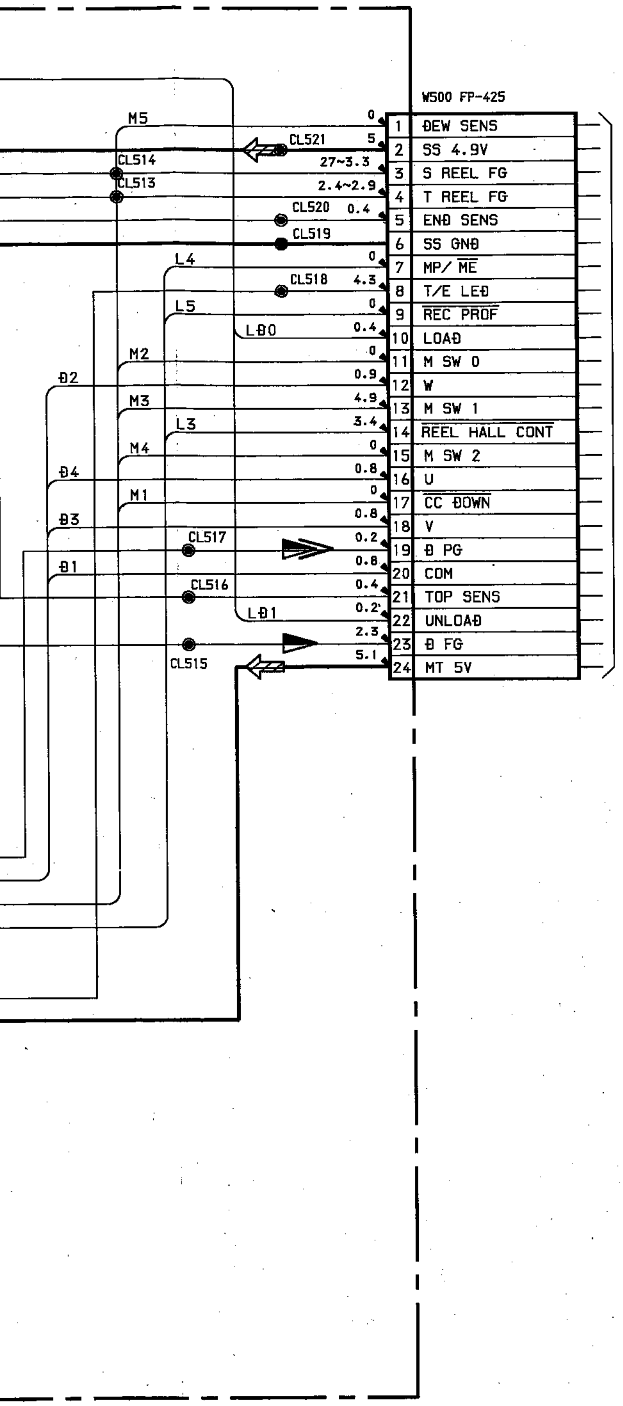
— Ref. No. SL-22 BOARD: 3000 series —



1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
A-MECHA
SL-22 BOAR
M903
LOADING MOTOR
M
LM-40 BOARD
CN002 4P
1 UNLOAD
2 UNLOAD
3 LOAD
4 LOAD
FP-437
(FLEXIBLE)
W501 FP-437
UNLOAD 1
UNLOAD 2
LOAD 3
LOAD 4
LD1
LD0
M901
DRUM MOTOR
CN005 7P
1 PG (+)
2 PG/FG COM
3 FG (+)
4 COM
5 W
6 V
7 U
FP-441
(FLEXIBLE)
CN501 7P NON ZIF
PG (+) 1
PG/FG COM 2
FG (+) 3
COM 4
W 5
V 6
U 7
CL512
CL511
CL510
D1
D2
D3
D4
S1
FP-442 BOARD (FLEXIBLE)
S001 MODE SWITCH
CN003 6P
1 M SW 2
2 M SW 1
3 M SW 0
4 DEW SENS
5 SS GND
6 CC DOWN
R009
DEW SENSE
S005
CC DOWN SWITCH
FP-442
(FLEXIBLE)
CN502 6P NON ZIF
M SW 2 1
M SW 1 2
M SW 0 3
DEW SENS 4
SS GND 5
CC DOWN 6
M4
M3
M2
M5
CL509
M1
Q002
END
SENSOR
D001
T/E LED
Q001
TOP
SENSOR
R004
470
R011
470
R003
470
R010
470
CN001 15P
1 T/E LED
2 MT 5V
3 TOP SENS
4 END SENS
5 T REEL (+)
6 T REEL (-)
7 REEL HALL CONT
8 S REEL (+)
9 S REEL (-)
10 13V/7V
11 13V/10V
12 SS GND
13 MP/ME
14 MP/MP-HG
15 REC PROF
FP-443
(FLEXIBLE)
CN503 15P NON ZIF
T/E LED 1
MT 5V 2
TOP SENS 3
END SENS 4
T REEL (+) 5
T REEL (-) 6
REEL HALL CONT 7
S REEL (+) 8
S REEL (-) 9
13V/7V 10
13V/10V 11
SS GND 12
MP/ME 13
MP/MP-HG 14
REC PROF 15
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
S1
S2
S3
L3
S4
S5
L4
L5
S002
ME/MP SWITCH
09
M902
CAPSTAN MOTOR
IC001
MCD002AM
1
2
3
4
5
6
32
30
28
26
25
24
CN004 6P
1 UNREG GND
2 VS
3 VCC
4 STBY
5 REC CAP/FG
6 FG OUT
TO
CS-31 BOARD
CN502 (1-6PIN)
FP-425 (FLEXIBLE)
(See Page 120)
IC001
CAPSTAN MOTOR DRIVE/
WAVE SHAPER
LS-33 BOARD

SL-22 BOARD no mark : REC/PB mode


8
9
10
11
12
13
14
15
LD1
LD0
S1
S2
S3
S4
S5
M1
M2
M3
M4
M5
D1
D2
D3
D4
L3
L4
L5
CL500
CL501
CL502
CL503
CL504
CL505
CL506
CL507
CL508
CL509
CL510
CL511
CL512
CL513
CL514
RB500 10K
R506 100k
R514 100k
RB502 10K
C500 10 16V :AL
C504 10 6.3V :TA
Q501 XN4501
QQ501 (B-8)
TAPE TOP/END DETECT
R501 39K
80K
2K
200
500
50K
1500
100K
1K
9K
2V
IC501 LB8111V
R512 100k
C503 1 50V :AL
C507 0.01
C505 0.047 :2125 B
C506 4700p B
IC501 (A-7)
WAVE SHAPER/
S REEL FG AMP
R517 100 1/8W
R519 0
R520 0
R519, R520 SPACER RESISTER
IF
ZIF
5V
COM
W
V
U
GND
09


W500 FP-425
1 DEW SENS
2 SS 4.9V
3 S REEL FG
4 T REEL FG
5 END SENS
6 SS GND
7 MP/ ME
8 T/E LED
9 REC PROF
10 LOAD
11 M SW 0
12 W
13 M SW 1
14 REEL HALL CONT
15 M SW 2
16 U
17 CC DOWN
18 V
19 D PG
20 COM
21 TOP SENS
22 UNLOAD
23 D FG
24 MT 5V
0
5
27~3.3
2.4~2.9
0.4
0
4.3
0
0.4
0
0.9
4.9
3.4
0
0.8
0
0.8
0.2
0.8
0.4
0.2
2.3
5.1
M5
CL521
CL514
CL513
CL520
CL519
L4
CL518
L5
LD0
M2
D2
M3
L3
M4
D4
M1
D3
CL517
D1
CL516
LD1
CL515

TO
CS-31 BOARD
CN502 (7-30PIN)
FP-425 (FLEXIBLE)

(See Page 120)

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		►	
Drum phase servo		►►	
Drum servo (speed and phase)		►►►	
Capstan speed servo			
Capstan phase servo	■»	▣»	□»
Capstan servo (speed and phase)		▣»	
Ref. signal			

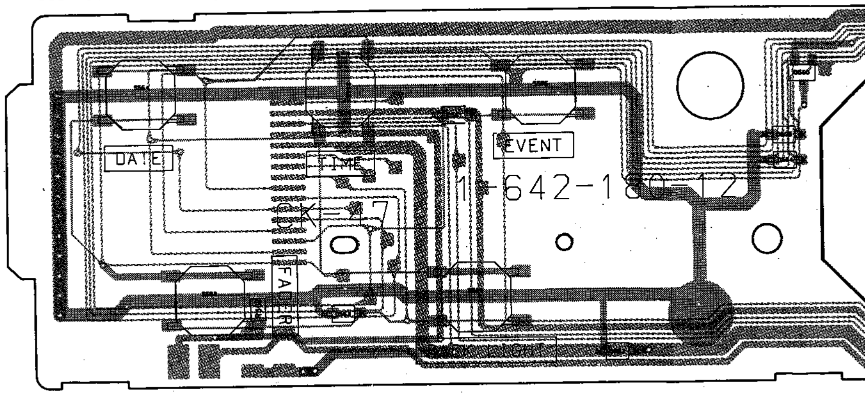
CK-47 (CAMERA CONTROL SWITCH), PK-30 (VTR/CAMERA SWITCH), DK

— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-

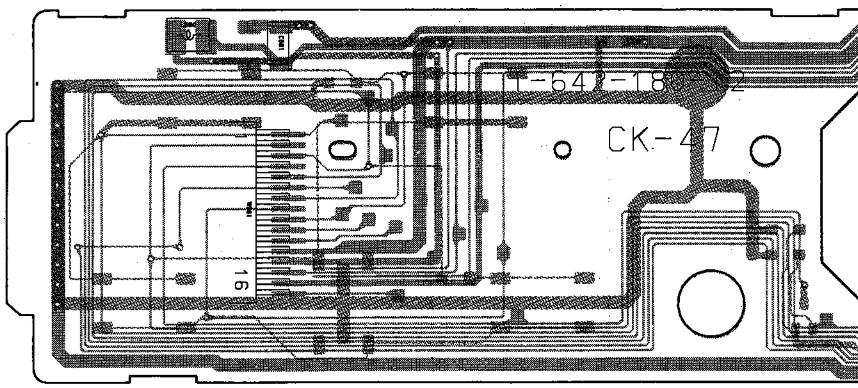
〈 DIODE 〉

D560	8-719-820-05	DIODE	1SS181
D561	8-719-404-46	DIODE	MA110
D562	8-719-110-03	DIODE	RD7. 5ES-B2
D563	8-719-110-03	DIODE	RD7. 5ES-B2
D564	8-719-110-03	DIODE	RD7. 5ES-B2
D565	8-719-110-03	DIODE	RD7. 5ES-B2

CK-47 BOARD (COMPONENT SIDE)


DATE
TIME
EVENT
1-642-180-12
CK-47
FADER
BACK LIGHT

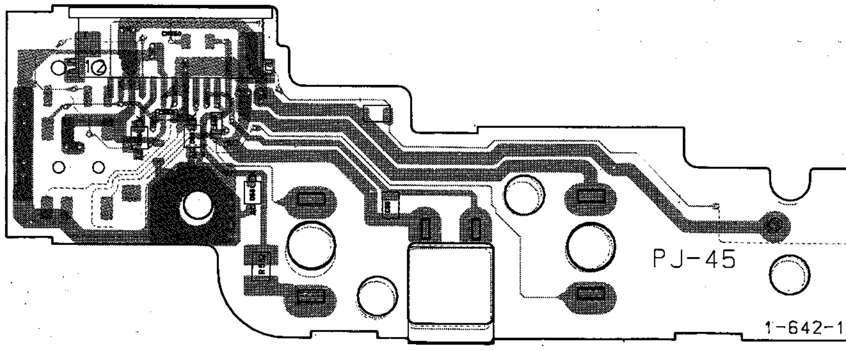
CK-47 BOARD (CONDUCTOR SIDE)


1-642-180-12
CK-47
16

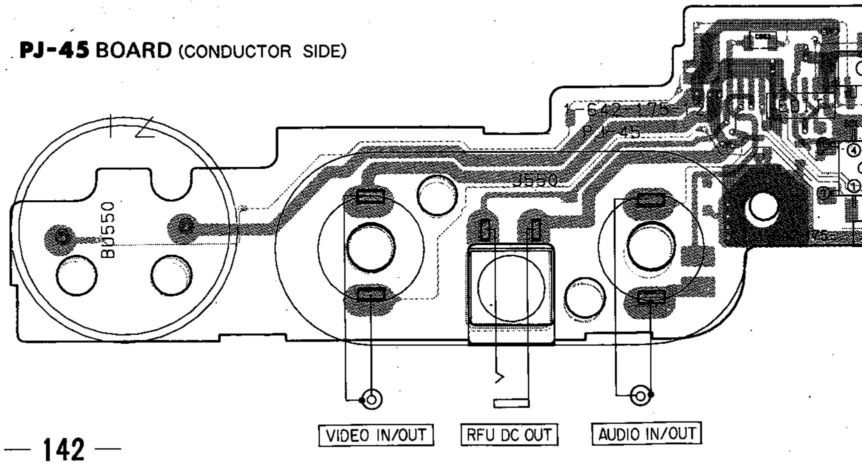
〈 DIODE 〉

D550	8-719-404-46	DIODE	MA110
D551	8-719-110-03	DIODE	RD7. 5ESB2
D552	8-719-110-03	DIODE	RD7. 5ESB2

PJ-45 BOARD (COMPONENT SIDE)



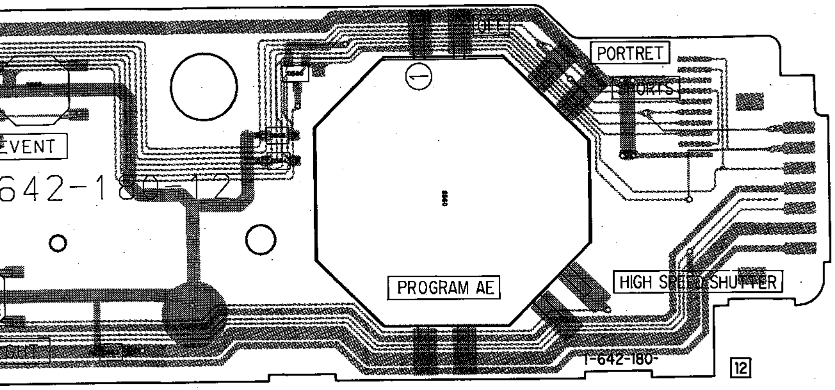
PJ-45 BOARD (CONDUCTOR SIDE)


BU550
J550
1-642-175
VIDEO IN/OUT
RFU DC OUT
AUDIO IN/OUT

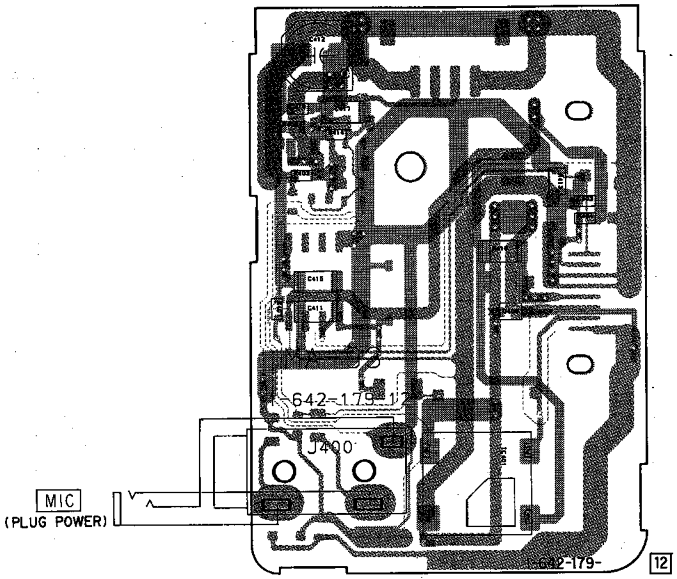
(VTR/CAMERA SWITCH), DK-20 (RESET SWITCH), SW-200 (CAMERA START/STOP), VK-22 (VTR CONTROL SWITCH), MA-93 (MIC

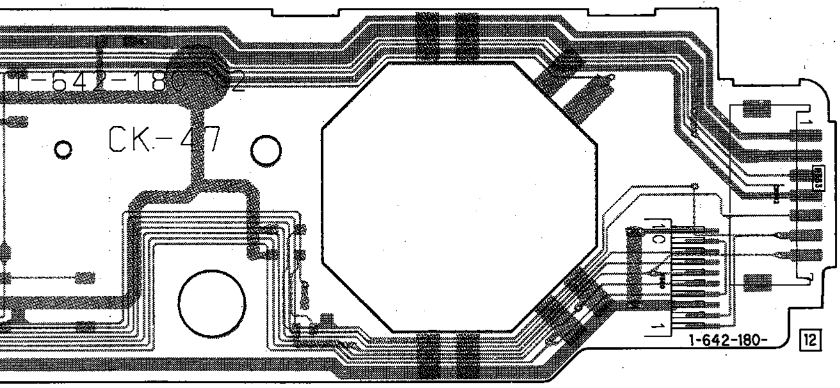
eries, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —

	⟨ DIODE ⟩				⟨ IC ⟩	
D400	8-719-110-03	DIODE	RD7.5ES-B2	IC400	8-759-822-37	IC
D401	8-719-110-03	DIODE	RD7.5ES-B2	IC401	8-749-923-29	IC

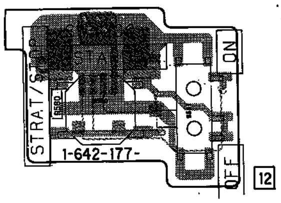

OFF
PORTRET
SPORTS
①
EVENT
642-180-12
PROGRAM AE
HIGH SPEED SHUTTER
1-642-180-
12

MA-93 BOARD (COMPONENT SIDE)

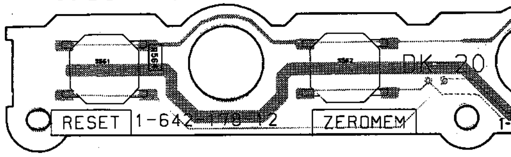

642-179-12
J400
MIC
(PLUG POWER)
1-642-179-
12

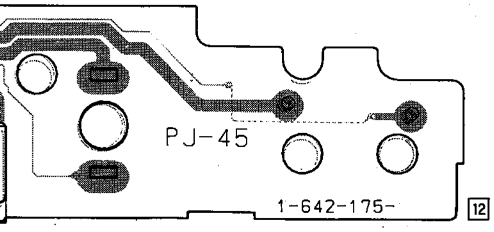

1-642-180-12
CK-47
1
1
1-642-180-
12

SW-200 BOARD (COMPONENT SIDE)

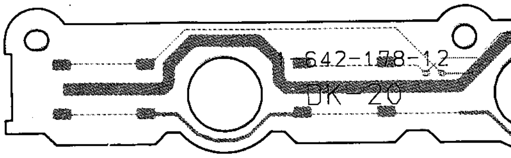

ON
STRAT/STOP
1-642-177-
OFF
12

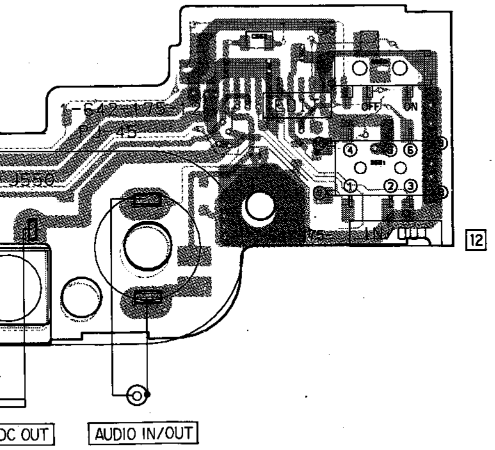
DK-20 BOARD (COMPONENT SIDE)


RESET
1-642-178-12
ZEROMEM
DK-20


PJ-45
1-642-175-
12

DK-20 BOARD (CONDUCTOR SIDE)


1-642-178-12
DK-20


1-642-175
45
OFF
ON
④
⑤
⑥
①
②
③
J550
12
DC OUT
AUDIO IN/OUT

H), MA-93 (MIC AMP), PJ-45 (VIDEO/AUDIO IN/OUT) PRINTED WIRING BOARDS

⟨ IC ⟩

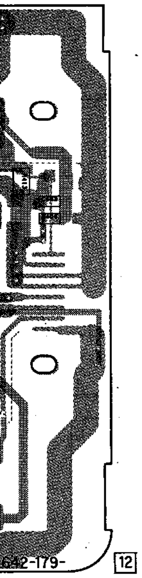
8-759-822-37 IC LA7293M-TE-L

8-749-923-29 IC RS-20E-T

⟨ TRANSISTOR ⟩

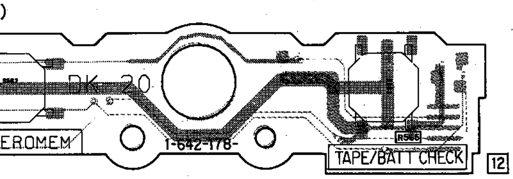
Q400 8-729-905-23 TRANSISTOR 2SA1576-R

T SIDE)



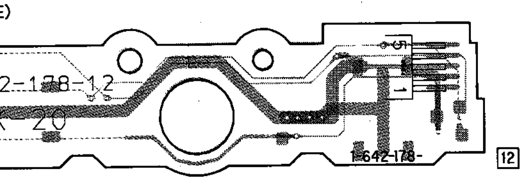
NENT SIDE)

)



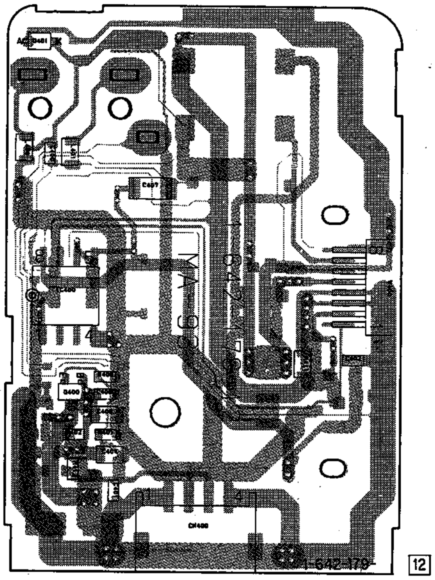
PK-20
EROMEM
1-642-178-
TAPE/BATT CHECK
12

E)

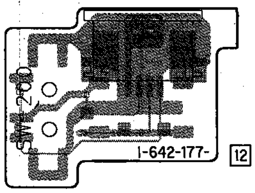


2-178-12
K-20
1-642-178-
12

MA-93 BOARD (CONDUCTOR SIDE)

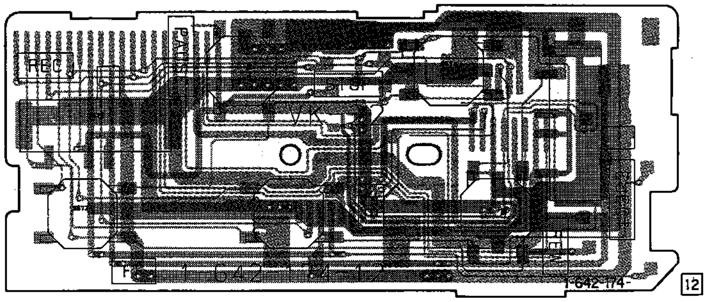


SW-200 BOARD (CONDUCTOR SIDE)



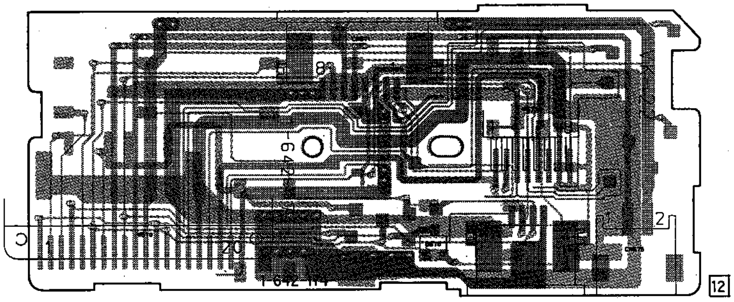
SW-200
1-642-177-
12

VK-22 BOARD (COMPONENT SIDE)



REC
1-642-174-
12

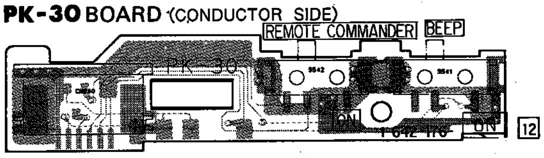
VK-22 BOARD (CONDUCTOR SIDE)



⟨ DIODE ⟩

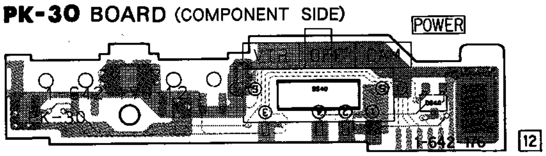
D570 8-719-820-05 DIODE 1SS181

PK-30 BOARD (CONDUCTOR SIDE)



REMOTE COMMANDER
BEEP
PK-30
ON
1-642-176-
ON
12

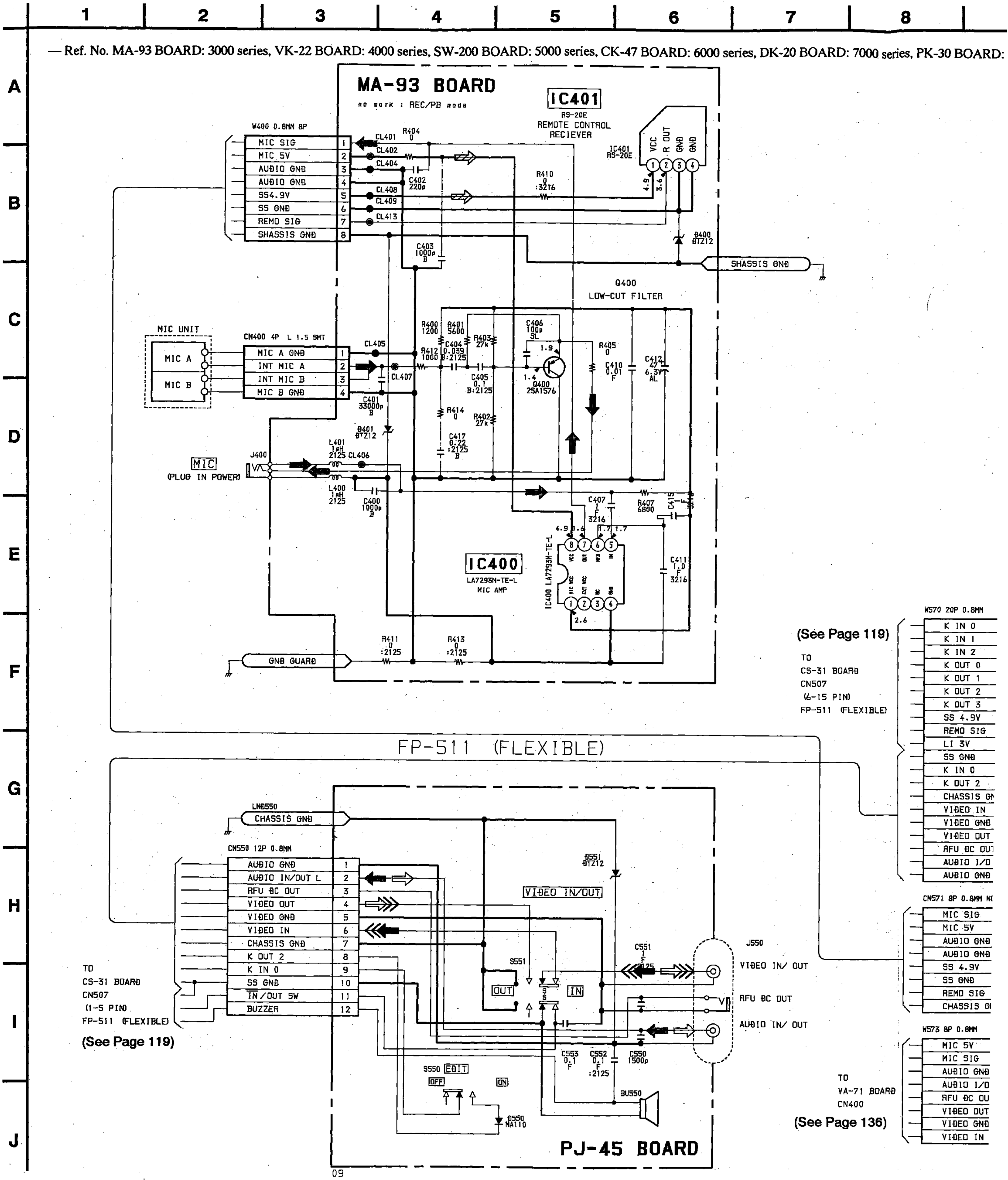
PK-30 BOARD (COMPONENT SIDE)



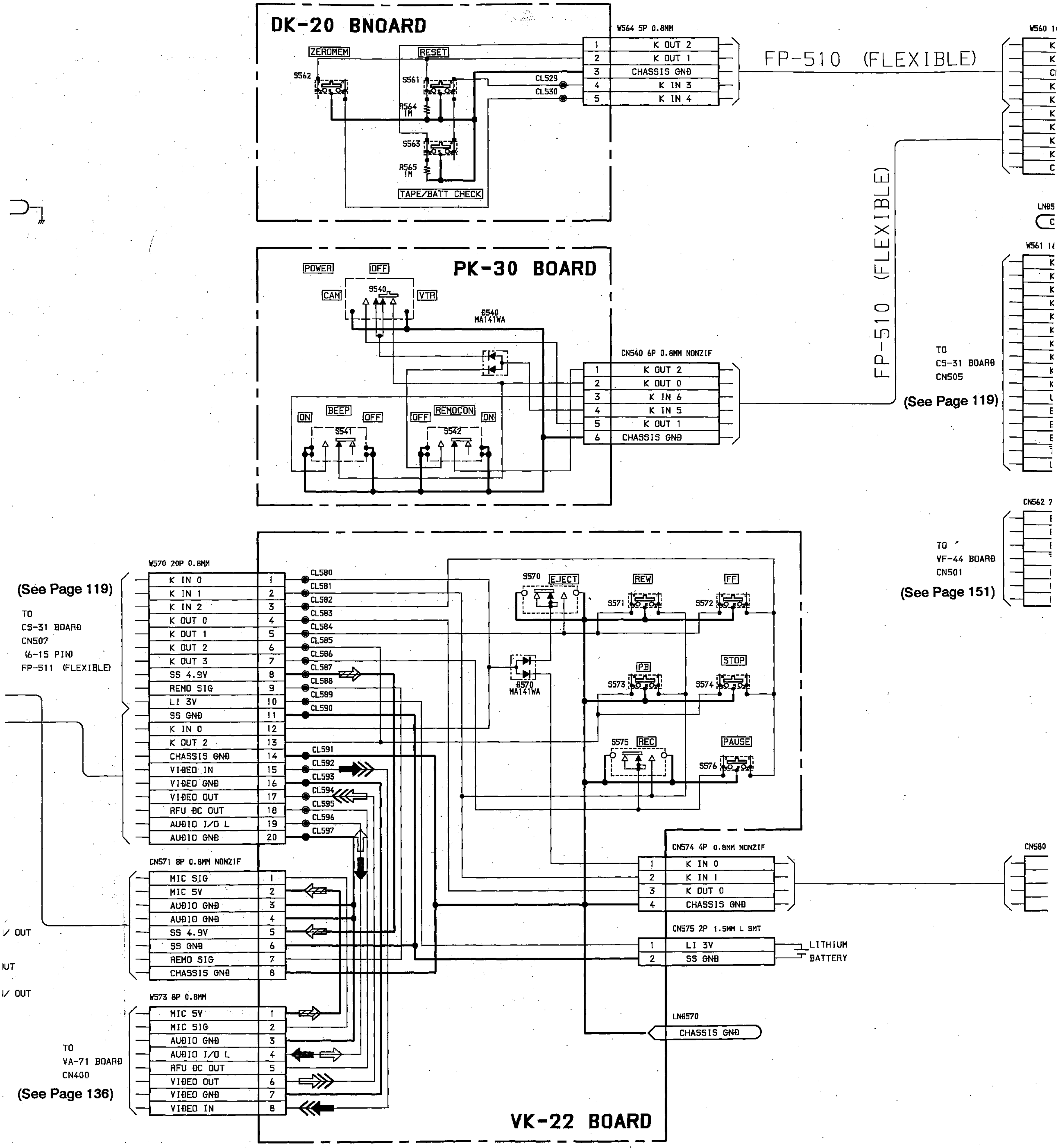
POWER
PK-30
1-642-176-
12

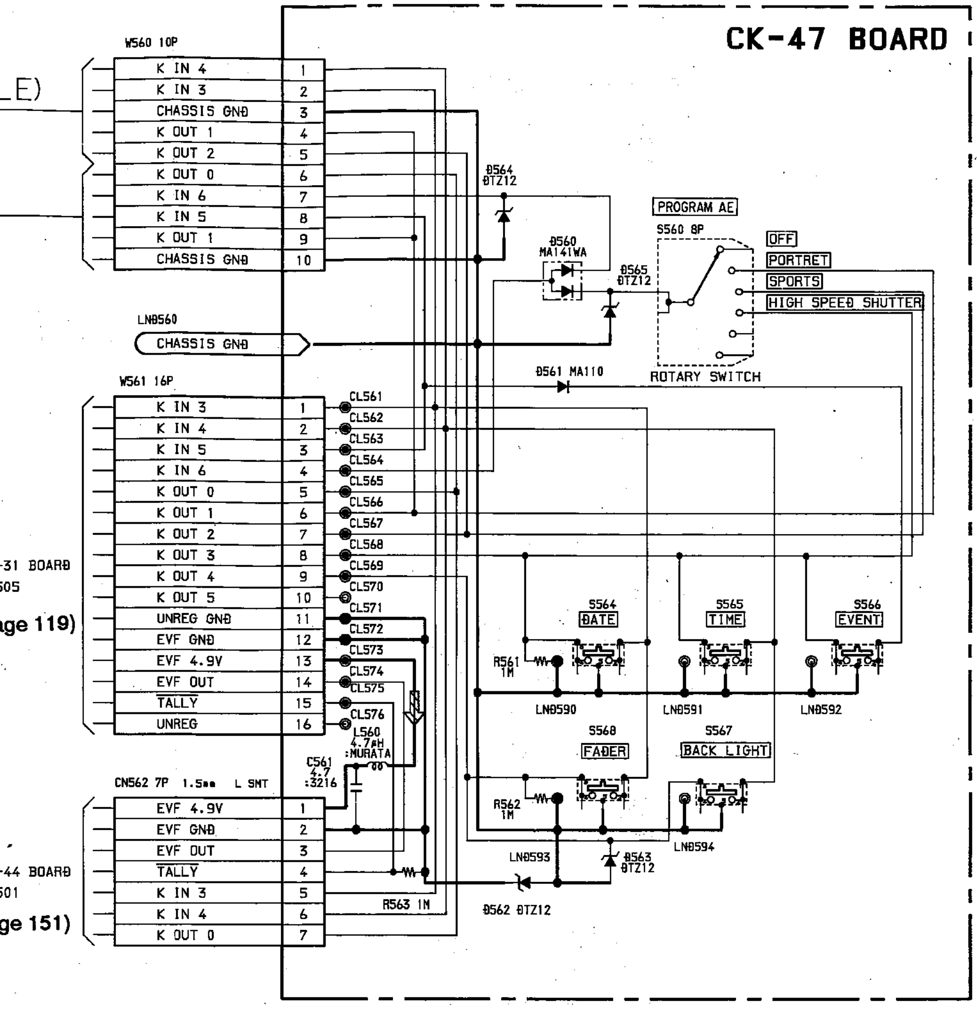
CK-47 (CAMERA CONTROL SWITCH), PK-30 (VTR/CAMERA SWITCH), DK-20 (RESET SWITCH), SW-200 (CAMERA START/STC

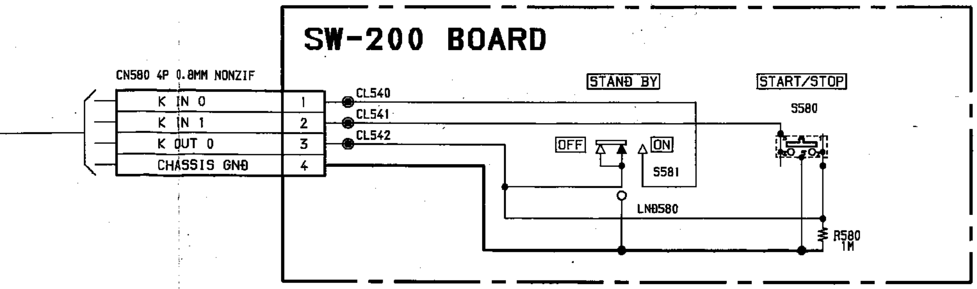
— Ref. No. MA-93 BOARD: 3000 series, VK-22 BOARD: 4000 series, SW-200 BOARD: 5000 series, CK-47 BOARD: 6000 series, DK-20 BOARD: 7000 series, PK-30 BOARD:


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
MA-93 BOARD
no mark : REC/PB mode
IC401
RS-20E
REMOTE CONTROL
RECIEVER
IC401
RS-20E
VCC
R OUT
GND
GND
4.9
3.6
W400 0.8MM 8P
MIC SIG 1
MIC 5V 2
AUDIO GND 3
AUDIO GND 4
SS4.9V 5
SS GND 6
REMO SIG 7
SHASSIS GND 8
CL401
R404 0
CL402
CL404
C402 220p
CL408
CL409
CL413
R410 0 :3216
C403 1000p B
D400 DTZ12
SHASSIS GND
Q400
LOW-CUT FILTER
MIC UNIT
MIC A
MIC B
CN400 4P L 1.5 SMT
MIC A GND 1
INT MIC A 2
INT MIC B 3
MIC B GND 4
CL405
CL407
C401 33000p B
R400 1200
R401 5600
R412 1000
C404 0.039 B:2125
R403 27k
C405 0.1 B:2125
C406 100p SL
1.9
1.4
Q400 2SA1576
R405 0
C410 0.01 F
C412 47 6.3V AL
R414 0
R402 27k
C417 0.22 :2125 B
D401 DTZ12
L401 1µH 2125
CL406
J400
MIC
(PLUG IN POWER)
L400 1µH 2125
C400 1000p B
C407 1 F 3216
R407 6800
C415 1 F 3216
4.9
1.6
1.7
1.7
IC400
LA7293M-TE-L
MIC AMP
IC400 LA7293M-TE-L
VCC
OUT
NFB
IN
MIC VCC
EXT VCC
NC
GND
2.6
C411 1.0 F 3216
R411 0 :2125
R413 0 :2125
GND GUARD
FP-511 (FLEXIBLE)
(See Page 119)
TO
CS-31 BOARD
CN507
(6-15 PIN)
FP-511 (FLEXIBLE)
W570 20P 0.8MM
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
SS 4.9V
REMO SIG
LI 3V
SS GND
K IN 0
K OUT 2
CHASSIS GN
VIDEO IN
VIDEO GND
VIDEO OUT
RFU DC OU
AUDIO I/O
AUDIO GND
CN571 8P 0.8MM N
MIC SIG
MIC 5V
AUDIO GND
AUDIO GND
SS 4.9V
SS GND
REMO SIG
CHASSIS G
W573 8P 0.8MM
MIC 5V
MIC SIG
AUDIO GND
AUDIO I/O
RFU DC OU
VIDEO OUT
VIDEO GND
VIDEO IN
TO
VA-71 BOARD
CN400
(See Page 136)
LND550
CHASSIS GND
CN550 12P 0.8MM
AUDIO GND 1
AUDIO IN/OUT L 2
RFU DC OUT 3
VIDEO OUT 4
VIDEO GND 5
VIDEO IN 6
CHASSIS GND 7
K OUT 2 8
K IN 0 9
SS GND 10
IN/OUT SW 11
BUZZER 12
TO
CS-31 BOARD
CN507
(1-5 PIN)
FP-511 (FLEXIBLE)
(See Page 119)
D551 DTZ12
VIDEO IN/OUT
S551
OUT
IN
C551 1 F :2125
J550
VIDEO IN/ OUT
RFU DC OUT
AUDIO IN/ OUT
C553 0.1 F
C552 0.1 F :2125
C550 1500p
S550 EDIT
OFF
ON
D550 MA110
BU550
PJ-45 BOARD
09

BOARD: 7000 series, PK-30 BOARD: 8000 series, PJ-45 BOARD: 9000 series —


DK-20 BNOARD
ZEROMEM
RESET
S562
S561
R564 1M
S563
R565 1M
TAPE/BATT CHECK
CL529
CL530
W564 5P 0.8MM
1 K OUT 2
2 K OUT 1
3 CHASSIS GND
4 K IN 3
5 K IN 4
FP-510 (FLEXIBLE)
W560
PK-30 BOARD
POWER
OFF
CAM
VTR
S540
D540 MA141WA
BEEP
ON
OFF
S541
REMOCON
S542
CN540 6P 0.8MM NONZIF
1 K OUT 2
2 K OUT 0
3 K IN 6
4 K IN 5
5 K OUT 1
6 CHASSIS GND
FP-510 (FLEXIBLE)
TO CS-31 BOARD CN505
(See Page 119)
W561
LND85
CN562
TO VF-44 BOARD CN501
(See Page 151)
W570 20P 0.8MM
1 K IN 0
2 K IN 1
3 K IN 2
4 K OUT 0
5 K OUT 1
6 K OUT 2
7 K OUT 3
8 SS 4.9V
9 REMO SIG
10 LI 3V
11 SS GND
12 K IN 0
13 K OUT 2
14 CHASSIS GND
15 VIDEO IN
16 VIDEO GND
17 VIDEO OUT
18 RFU DC OUT
19 AUDIO I/O L
20 AUDIO GND
CL580
CL581
CL582
CL583
CL584
CL585
CL586
CL587
CL588
CL589
CL590
CL591
CL592
CL593
CL594
CL595
CL596
CL597
(See Page 119)
TO CS-31 BOARD CN507 (6-15 PIN) FP-511 (FLEXIBLE)
S570 EJECT
REW
FF
S571
S572
D570 MA141WA
PB
STOP
S573
S574
S575 REC
PAUSE
S576
CN571 8P 0.8MM NONZIF
1 MIC SIG
2 MIC 5V
3 AUDIO GND
4 AUDIO GND
5 SS 4.9V
6 SS GND
7 REMO SIG
8 CHASSIS GND
CN574 4P 0.8MM NONZIF
1 K IN 0
2 K IN 1
3 K OUT 0
4 CHASSIS GND
CN580
CN575 2P 1.5MM L SMT
1 LI 3V
2 SS GND
LITHIUM BATTERY
/ OUT
UT
/ OUT
W573 8P 0.8MM
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
LND570
CHASSIS GND
TO VA-71 BOARD CN400
(See Page 136)
VK-22 BOARD


CK-47 BOARD
W560 10P
LE)
K IN 4 1
K IN 3 2
CHASSIS GND 3
K OUT 1 4
K OUT 2 5
K OUT 0 6
K IN 6 7
K IN 5 8
K OUT 1 9
CHASSIS GND 10
LND560
CHASSIS GND
W561 16P
K IN 3 1
K IN 4 2
K IN 5 3
K IN 6 4
K OUT 0 5
K OUT 1 6
K OUT 2 7
K OUT 3 8
K OUT 4 9
K OUT 5 10
UNREG GND 11
EVF GND 12
EVF 4.9V 13
EVF OUT 14
TALLY 15
UNREG 16
-31 BOARD
505
age 119)
CL561
CL562
CL563
CL564
CL565
CL566
CL567
CL568
CL569
CL570
CL571
CL572
CL573
CL574
CL575
CL576
L560 4.7μH :MURATA
C561 4.7 :3216
CN562 7P 1.5mm L SNT
EVF 4.9V 1
EVF GND 2
EVF OUT 3
TALLY 4
K IN 3 5
K IN 4 6
K OUT 0 7
-44 BOARD
501
ge 151)
R563 1M
D562 DTZ12
D563 DTZ12
LND593
LND594
R562 1M
S568 FADER
S567 BACK LIGHT
R561 1M
LND590
LND591
LND592
S564 DATE
S565 TIME
S566 EVENT
D561 MA110
D564 DTZ12
D560 MA141WA
D565 DTZ12
PROGRAM AE
S560 8P
ROTARY SWITCH
OFF
PORTRET
SPORTS
HIGH SPEED SHUTTER

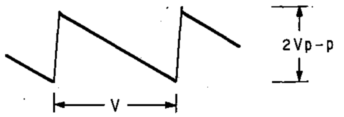

SW-200 BOARD
CN580 4P 0.8MM NONZIF
K IN 0 1
K IN 1 2
K OUT 0 3
CHASSIS GND 4
CL540
CL541
CL542
STAND BY
OFF
ON
S581
LND580
START/STOP
S580
R580 1M

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

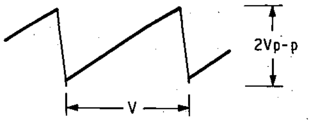
VF-44 BOARD

❶



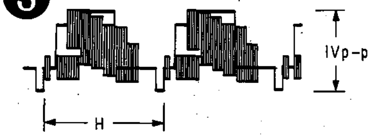
IC501 ③ VTR REC

❷



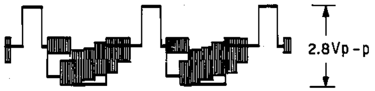
IC501 ⑤ VTR REC

❸



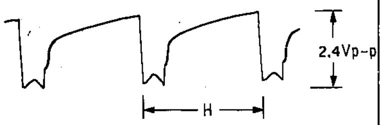
IC501 ⑨ VTR REC

❹



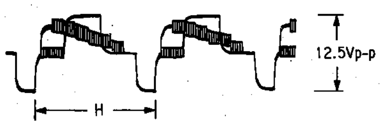
IC501 ⑪ VTR REC

❺



IC501 ⑭ VTR REC

❻



Q501 Ⓒ VTR REC

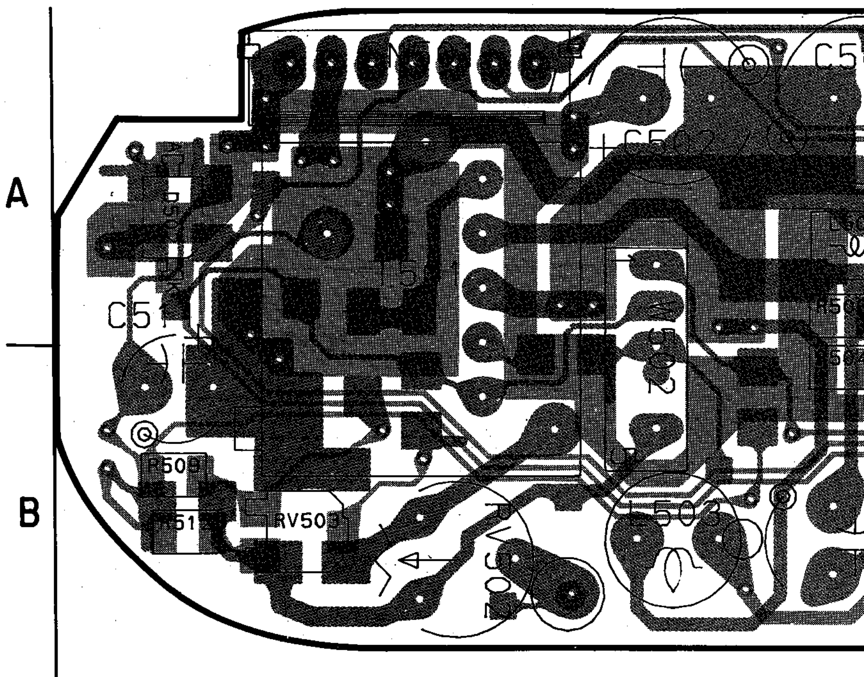
⚠D501	8-719-02
D502	8-719-02
D503	8-719-40
IC501	8-759-42
Q501	8-729-21
Q502	8-729-10
Q503	8-729-10

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

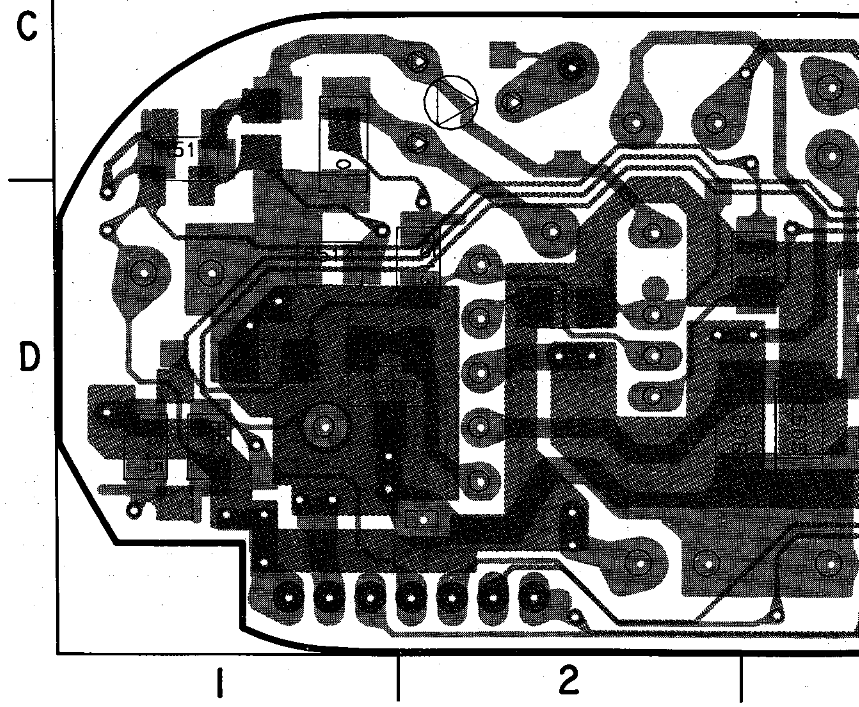
— Ref. No. VF-44 BOARD: 2000 series —

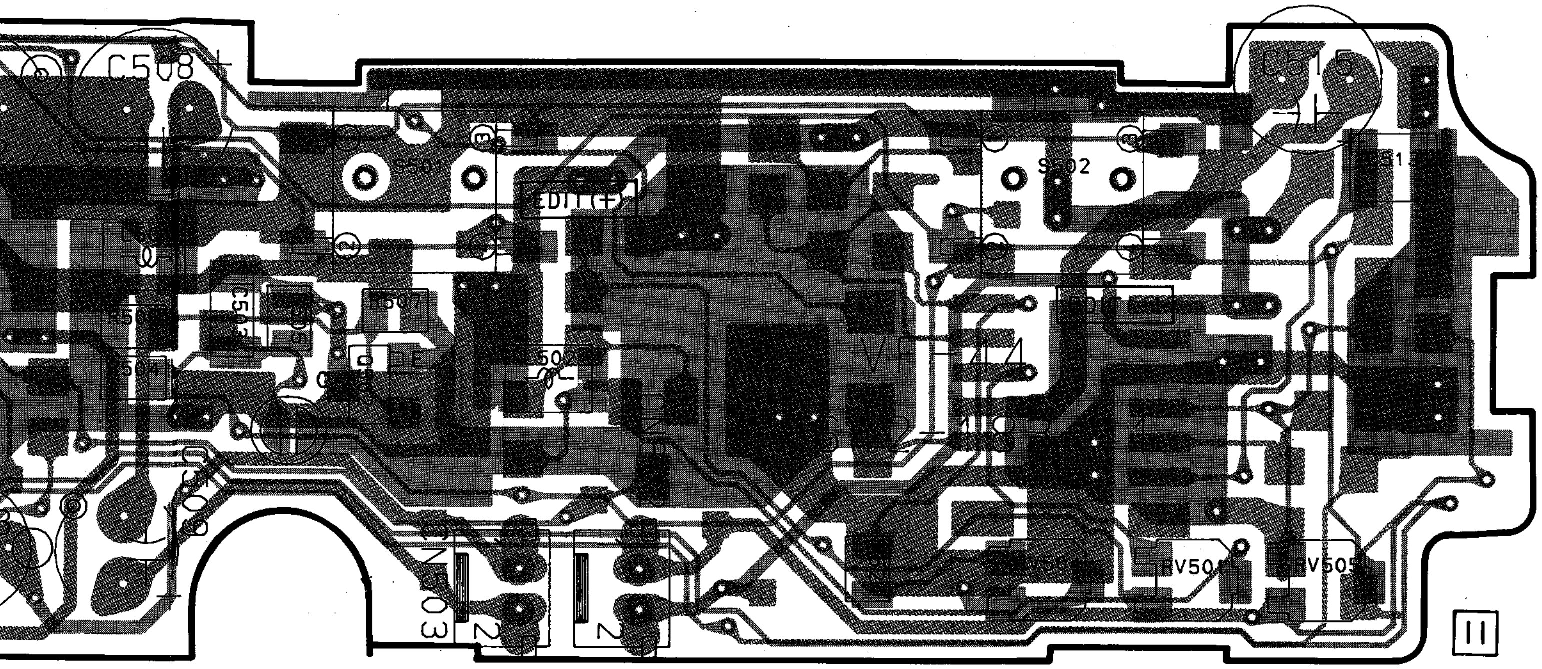
	⟨ DIODE ⟩		
⚠D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA
	⟨ IC ⟩		
IC501	8-759-420-01	IC	AN2512S
	⟨ TRANSISTOR ⟩		
Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q502	8-729-100-66	TRANSISTOR	2SC1623-L6
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

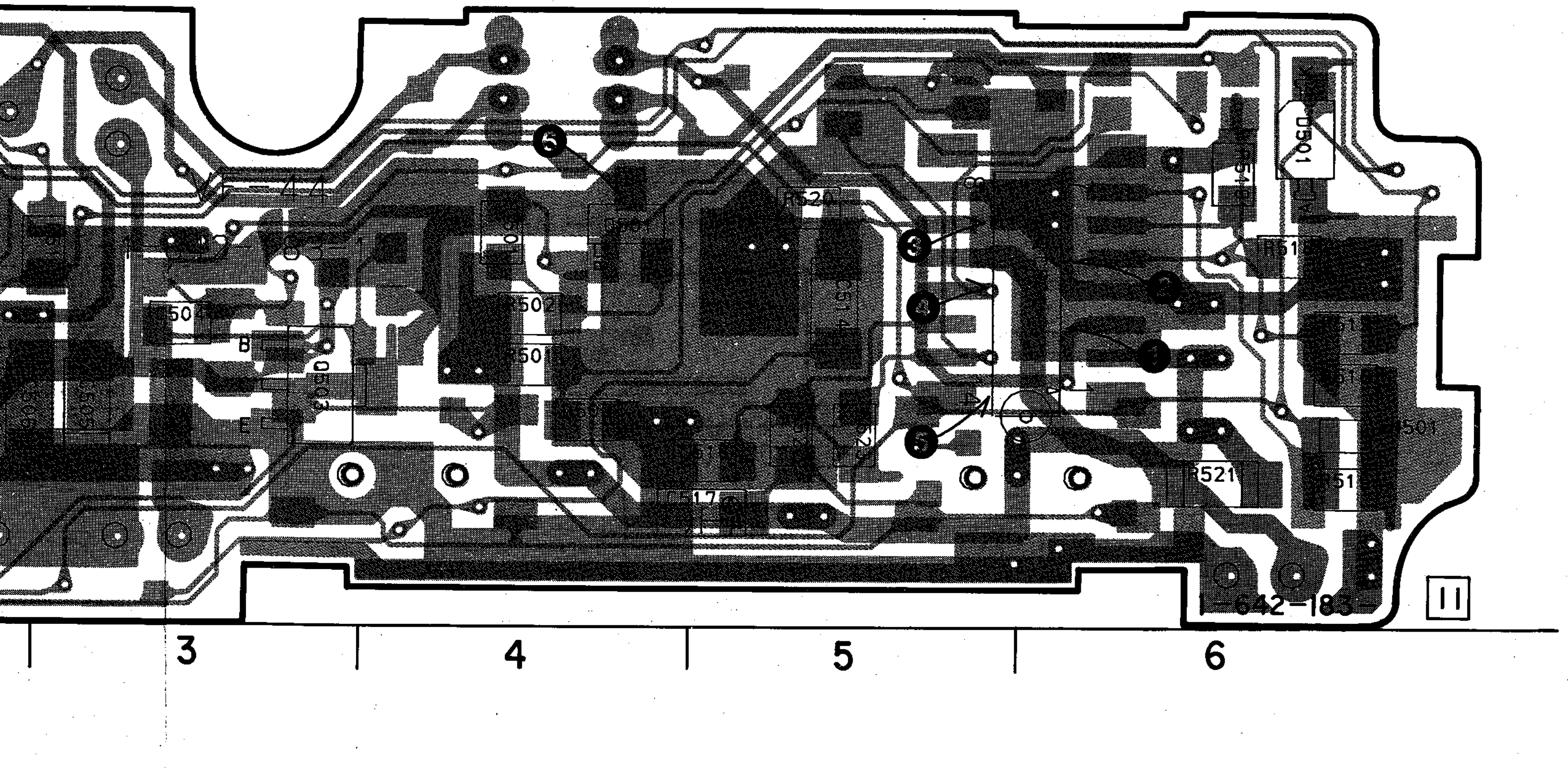
VF-44 (COMPONENT SIDE)


A
B
C5
C5
C51
R5
R50
R508
R51
RV503
L503
LND501

VF-44 (CONDUCTOR SIDE)



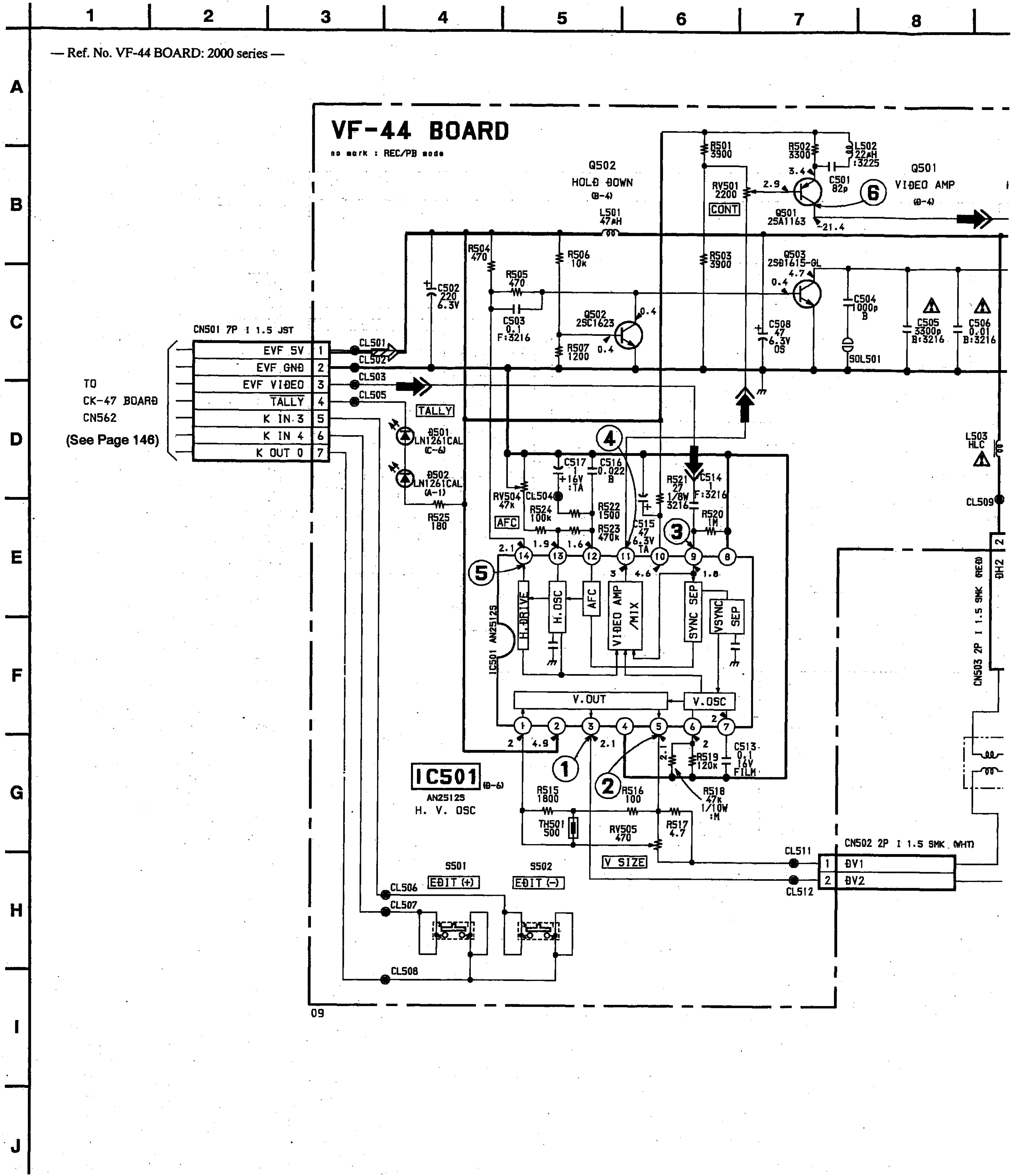

C508
C515
S501
S502
EDIT(+)
R507
R504
VF-44
CN503
RV503
RV504
RV505
11

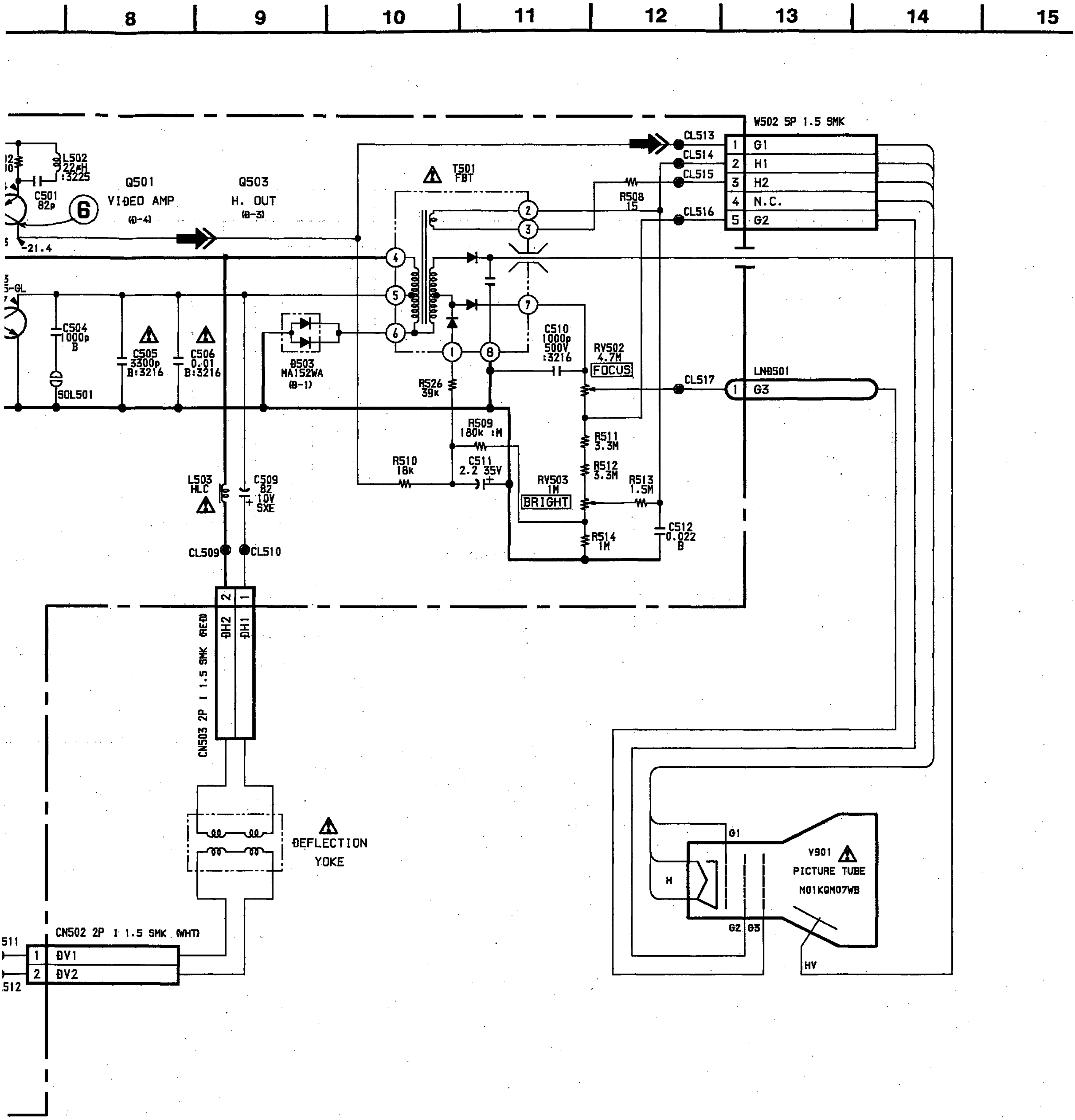

VF-44
R520
R502
R501
R504
B
E
D501
R521
1-642-183
11
3
4
5
6

NDER **VIEW FINDER**

VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-44 BOARD: 2000 series —


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
VF-44 BOARD
no mark : REC/PB mode
Q502
HOLD DOWN
(B-4)
L501
47μH
R501
3900
R502
3300
L502
22μH
:3225
RV501
2200
CONT
3.4
2.9
C501
82p
6
Q501
VIDEO AMP
(B-4)
Q501
2SA1163
-21.4
R504
470
R506
10k
R503
3900
Q503
2SD1615-GL
4.7
0.4
C502
220
6.3V
R505
470
C503
0.1
F:3216
Q502
2SC1623
0.4
0.4
R507
1200
C508
47
6.3V
OS
C504
1000p
B
SOL501
C505
3300p
B:3216
C506
0.01
B:3216
CN501 7P I 1.5 JST
EVF 5V
EVF GND
EVF VIDEO
TALLY
K IN 3
K IN 4
K OUT 0
1
2
3
4
5
6
7
CL501
CL502
CL503
CL505
TO
CK-47 BOARD
CN562
(See Page 146)
TALLY
D501
LN1261CAL
(C-6)
D502
LN1261CAL
(A-1)
R525
180
4
C517
1
16V
:TA
C516
0.022
B
R521
27
1/8W
3216
C514
1
F:3216
RV504
47k
CL504
AFC
R524
100k
R522
1500
R523
470k
C515
47
6.3V
TA
R520
1M
3
L503
HLC
CL509
2.1
1.9
1.6
3
4.6
1.8
14
13
12
11
10
9
8
5
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
IC501 AN2512S
V.OUT
V.OSC
1
2
3
4
5
6
7
2
4.9
2.1
2.1
2
2
C513
0.1
16V
FILM
R519
120k
IC501 (B-6)
AN2512S
H. V. OSC
1
2
R515
1800
R516
100
R518
47k
1/10W
:M
TH501
500
RV505
470
R517
4.7
V SIZE
CL511
CL512
CN502 2P I 1.5 SMK (WHT)
DV1
DV2
CN503 2P I 1.5 SMK (RED)
DH2
S501
EDIT (+)
S502
EDIT (-)
CL506
CL507
CL508
09

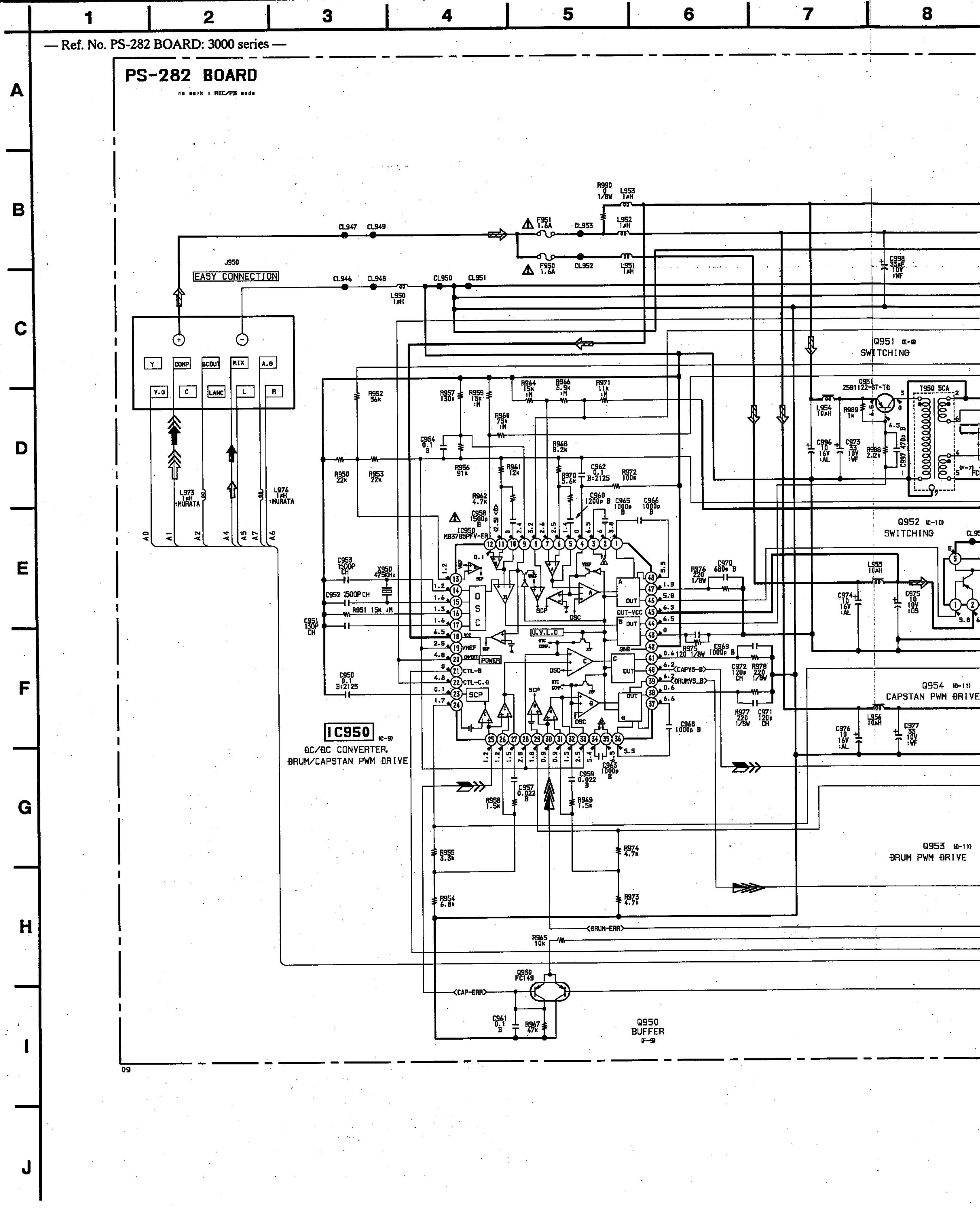

8
9
10
11
12
13
14
15
L502
22μH
:3225
C501
82p
6
Q501
VIDEO AMP
(B-4)
Q503
H. OUT
(B-3)
-21.4
-GL
T501
FBT
R508
15
CL513
CL514
CL515
CL516
W502 5P 1.5 SMK
1 G1
2 H1
3 H2
4 N.C.
5 G2
C504
1000p
B
SOL501
C505
3300p
B:3216
C506
0.01
B:3216
D503
MA152WA
(B-1)
R526
39k
C510
1000p
500V
:3216
RV502
4.7M
FOCUS
CL517
LN0501
1 G3
R509
180k :M
R510
18k
C511
2.2 35V
RV503
1M
BRIGHT
R511
3.3M
R512
3.3M
R513
1.5M
R514
1M
C512
0.022
B
L503
HLC
C509
82
10V
SXE
CL509
CL510
CN503 2P I 1.5 SMK (RED)
DH2
DH1
DEFLECTION
YOKE
CN502 2P I 1.5 SMK (WHT)
1 DV1
2 DV2
511
512
G1
H
V901
PICTURE TUBE
M01KQM07WB
G2 G3
HV

- **SIGNAL PATH**

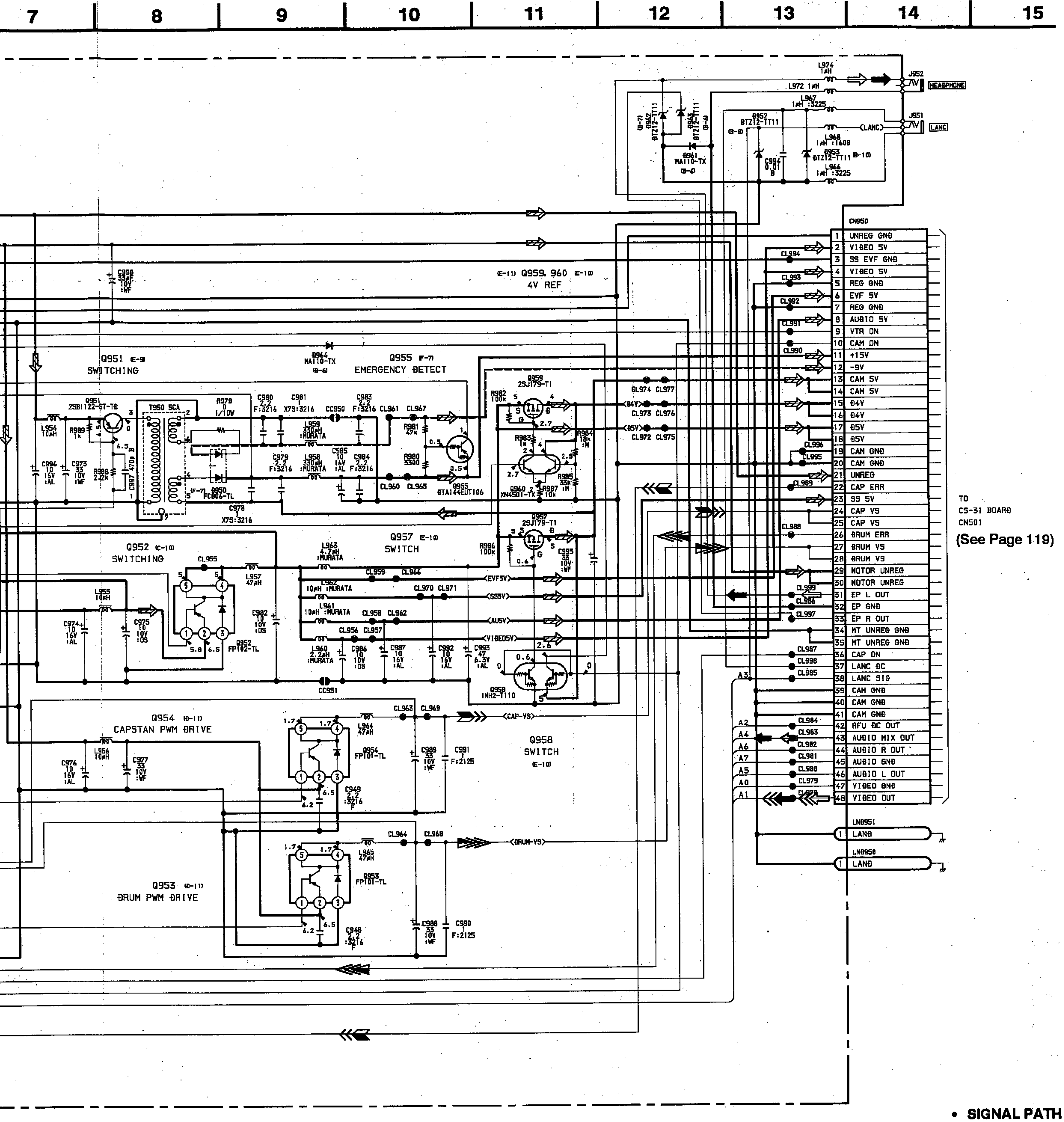
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡		
PB				

PS-282 (POWER REG) SCHEMATIC DIAGRAM

— Ref. No. PS-282 BOARD: 3000 series —


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
PS-282 BOARD
no mark : REC/PB mode
J950
EASY CONNECTION
Y
COMP
BCOUT
MIX
A.G
V.G
C
LANC
L
R
L973 1μH :MURATA
L976 1μH :MURATA
A0
A1
A2
A4
A5
A7
A6
CL947
CL949
CL946
CL948
CL950
CL951
CL952
CL953
L950 1μH
F951 1.6A
F950 1.6A
R990 0 1/8W
L953 1μH
L952 1μH
L951 1μH
C998 33μF 10V :WF
Q951 (E-9) SWITCHING
Q951 2SB1122-ST-TD
T950 SCA
L954 10μH
R989 1k
C996 10 16V :AL
C973 33 10V :WF
R988 2.2k
C997 470p B
Q952 (C-10) SWITCHING
L955 10μH
C974 10 16V :AL
C975 10 10V :OS
Q954 (D-11) CAPSTAN PWM DRIVE
L956 10μH
C976 10 16V :AL
C977 33 10V :WF
Q953 (D-11) DRUM PWM DRIVE
R952 56k
R957 130k
R959 15k :M
R964 15k
R966 3.9k :M
R971 11k :M
R960 75k :M
C954 0.1 B
R950 22k
R953 22k
R956 91k
R961 12k
R968 8.2k
R970 5.6k
C962 0.1 B:2125
R972 100k
R962 4.7k
C958 1500p B
C960 1200p B
C965 1000p B
C966 1000p B
IC950 MB3785PFV-ER
C953 1500P CH
X950 475kHz
C952 1500P CH
R951 15k :M
C951 150P CH
C950 0.1 B:2125
OSC
SCP
POWER
U.V.L.O
OUT
OUT-VCC
GND
CAPVS-B
DRUMVS-B
R976 220 1/8W
C970 680p B
R975 120 1/8W
C969 1000p B
C972 120p CH
R978 220 1/8W
R977 220 1/8W
C971 120p CH
C968 1000p B
C963 1000p B
C959 0.022 B
C957 0.022 B
R958 1.5k
R969 1.5k
IC950 (C-9)
DC/DC CONVERTER, DRUM/CAPSTAN PWM DRIVE
R955 3.3k
R974 4.7k
R954 6.8k
R973 4.7k
DRUM-ERR
R965 10k
Q950 FC149
CAP-ERR
C961 0.1 B
R967 47k
Q950 BUFFER (F-9)
09

POWER POW


7
8
9
10
11
12
13
14
15
J952 HEADPHONE
J951 LANC
L974 1μH
L972 1μH
L967 1μH :3225
L968 1μH :1608
L966 1μH :3225
D962 DTZ12-TT11
D963 DTZ12-TT11
D961 MA110-TX
D952 DTZ12-TT11
D953 DTZ12-TT11
C994 0.01 B
CN950
TO CS-31 BOARD CN501
(See Page 119)
1 UNREG GND
2 VIDEO 5V
3 SS EVF GND
4 VIDEO 5V
5 REG GND
6 EVF 5V
7 REG GND
8 AUDIO 5V
9 VTR ON
10 CAM ON
11 +15V
12 -9V
13 CAM 5V
14 CAM 5V
15 D4V
16 D4V
17 D5V
18 D5V
19 CAM GND
20 CAM GND
21 UNREG
22 CAP ERR
23 SS 5V
24 CAP VS
25 CAP VS
26 DRUM ERR
27 DRUM VS
28 DRUM VS
29 MOTOR UNREG
30 MOTOR UNREG
31 EP L OUT
32 EP GND
33 EP R OUT
34 MT UNREG GND
35 MT UNREG GND
36 CAP ON
37 LANC DC
38 LANC SIG
39 CAM GND
40 CAM GND
41 CAM GND
42 RFU DC OUT
43 AUDIO MIX OUT
44 AUDIO R OUT
45 AUDIO GND
46 AUDIO L OUT
47 VIDEO GND
48 VIDEO OUT
LND951 1 LAND
LND950 1 LAND
Q959, 960 4V REF
Q951 SWITCHING
Q951 2SB1122-ST-TB
T950 5CA
R979 0 1/10W
D964 MA110-TX
Q955 EMERGENCY DETECT
Q955 DTA144EUT106
Q959 2SJ179-T1
Q960 XN4501-TX
Q957 2SJ179-T1
Q957 SWITCH
Q952 SWITCHING
Q952 FP102-TL
Q958 IMH2-T110
Q958 SWITCH
Q954 CAPSTAN PWM DRIVE
Q954 FP101-TL
Q953 DRUM PWM DRIVE
Q953 FP101-TL
D950 FC806-TL
<EVF5V>
<SS5V>
<AU5V>
<VIDEO5V>
<CAP-VS>
<DRUM-VS>
<D4V>
<D5V>
<LANC>

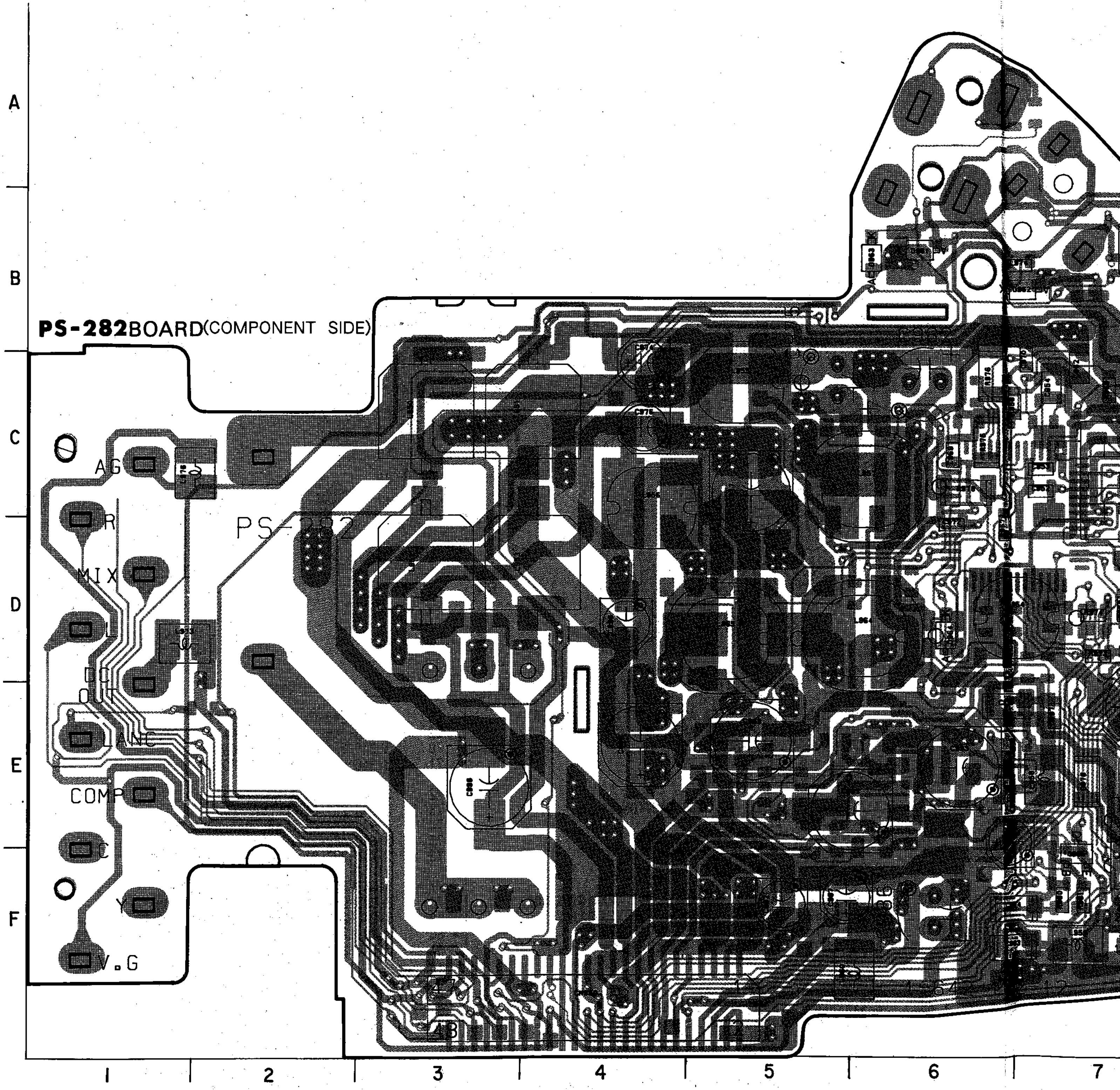
• **SIGNAL PATH**

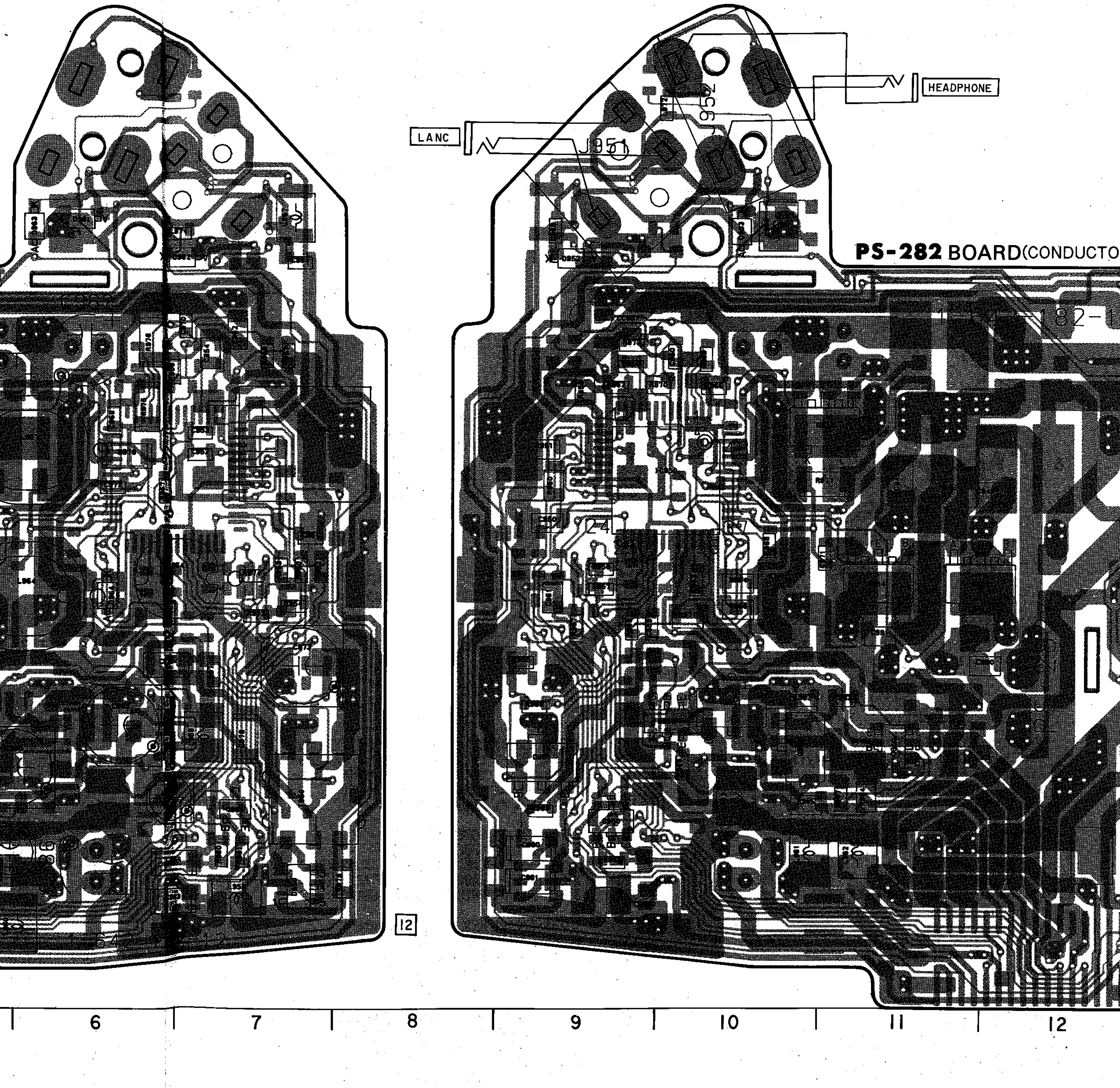
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan speed servo			
Capstan phase servo	➡》	➡》	▷》
Capstan servo (speed and phase)		➡》	

OWER **POWER**

PS-282 (POWER REG) PRINTED WIRING BOARD

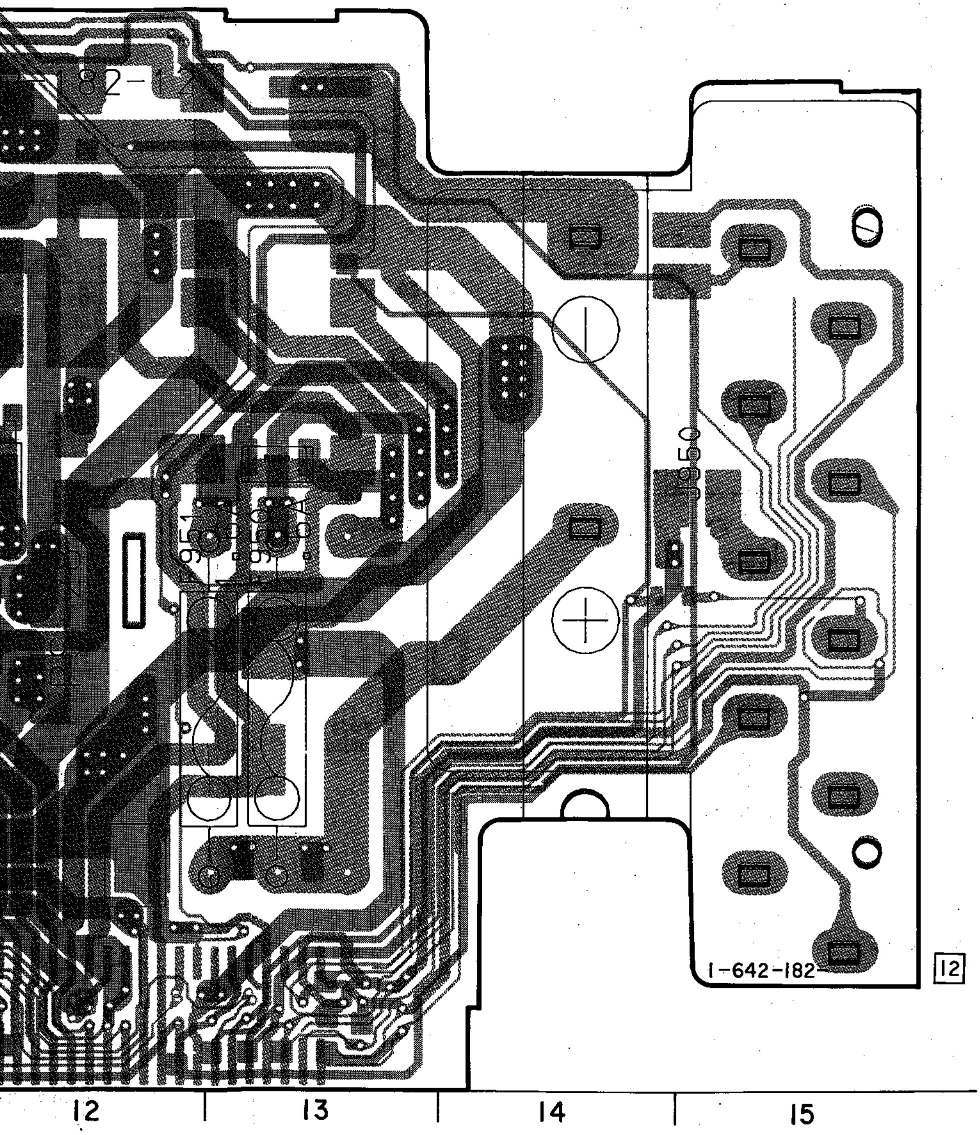
— Ref. No. PS-282 BOARD: 3000 series —


A
B
C
D
E
F
PS-282 BOARD (COMPONENT SIDE)
PS-282
AG
R
MIX
L
DC OUT
LANC
COMP
C
Y
V.G
1
2
3
4
5
6
7


LANC
HEADPHONE
J951
12
6
7
8
9
10
11
12

PS-282 BOARD(CONDUCTO

RD(CONDUCTOR SIDE)



〈 DIODE 〉

D950	8-719-989-33	DIODE	FC806-TL
D952	8-719-110-03	DIODE	RD7. 5ES-B2
D953	8-719-110-03	DIODE	RD7. 5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7. 5ES-B2
D963	8-719-110-03	DIODE	RD7. 5ES-B2
D964	8-719-404-46	DIODE	MA110

〈 IC 〉

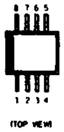
⚠IC950	8-759-517-40	IC	MB3785PFV

〈 TRANSISTOR 〉

Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-ST-TD
Q952	8-729-823-84	TRANSISTOR	PHOTO COUPLER FP102
Q953	8-729-823-82	TRANSISTOR	PHOTO COUPLER FP101
Q954	8-729-823-82	TRANSISTOR	PHOTO COUPLER FP101
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179-T1
Q958	8-729-920-48	TRANSISTOR	IMH2
Q959	8-729-011-26	TRANSISTOR	2SJ179-T1
Q960	8-729-402-81	TRANSISTOR	XN4501

4-3. SEMICONDUCTORS

AK6420F
LM358D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(TOP VIEW)

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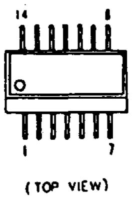
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(TOP VIEW)

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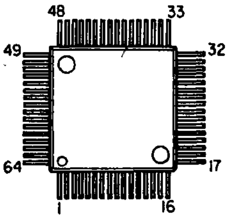
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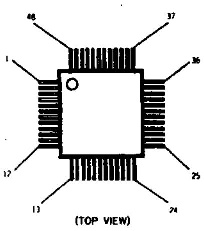
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(TOP VIEW)

CXA1211M
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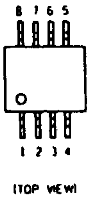
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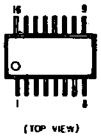
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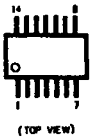
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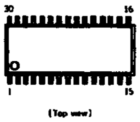
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(Top view)

CXD2100Q
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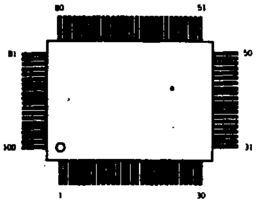
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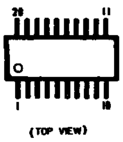
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(TOP VIEW)

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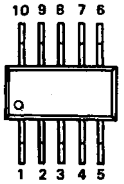
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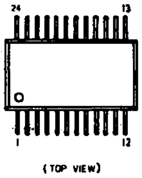
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(TOP VIEW)

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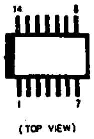
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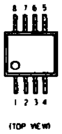
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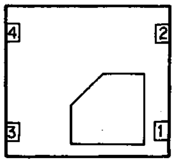
(TOP VIEW)

RS-20E-T



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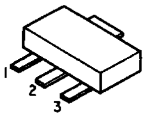

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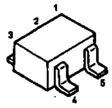
TC4S66F



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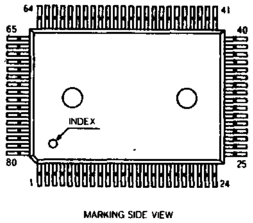
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MARKING SIDE VIEW

FC149
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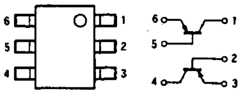

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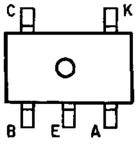
FP102



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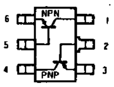
XN4601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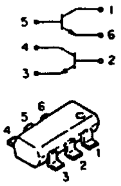
1MH2
XN4215
XN4501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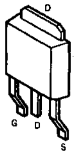
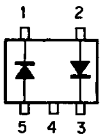
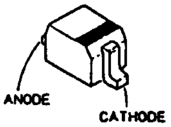


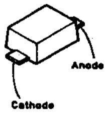
FC806-TL



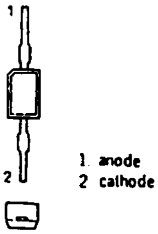
MA110


ANODE
CATHODE

MA728


Anode
Cathode

LN1261CAL


1
2
1. anode
2. cathode

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Ref. No.
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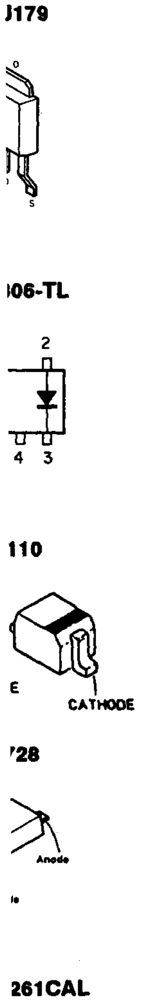


SECTION 5

EXPLODED VIEWS

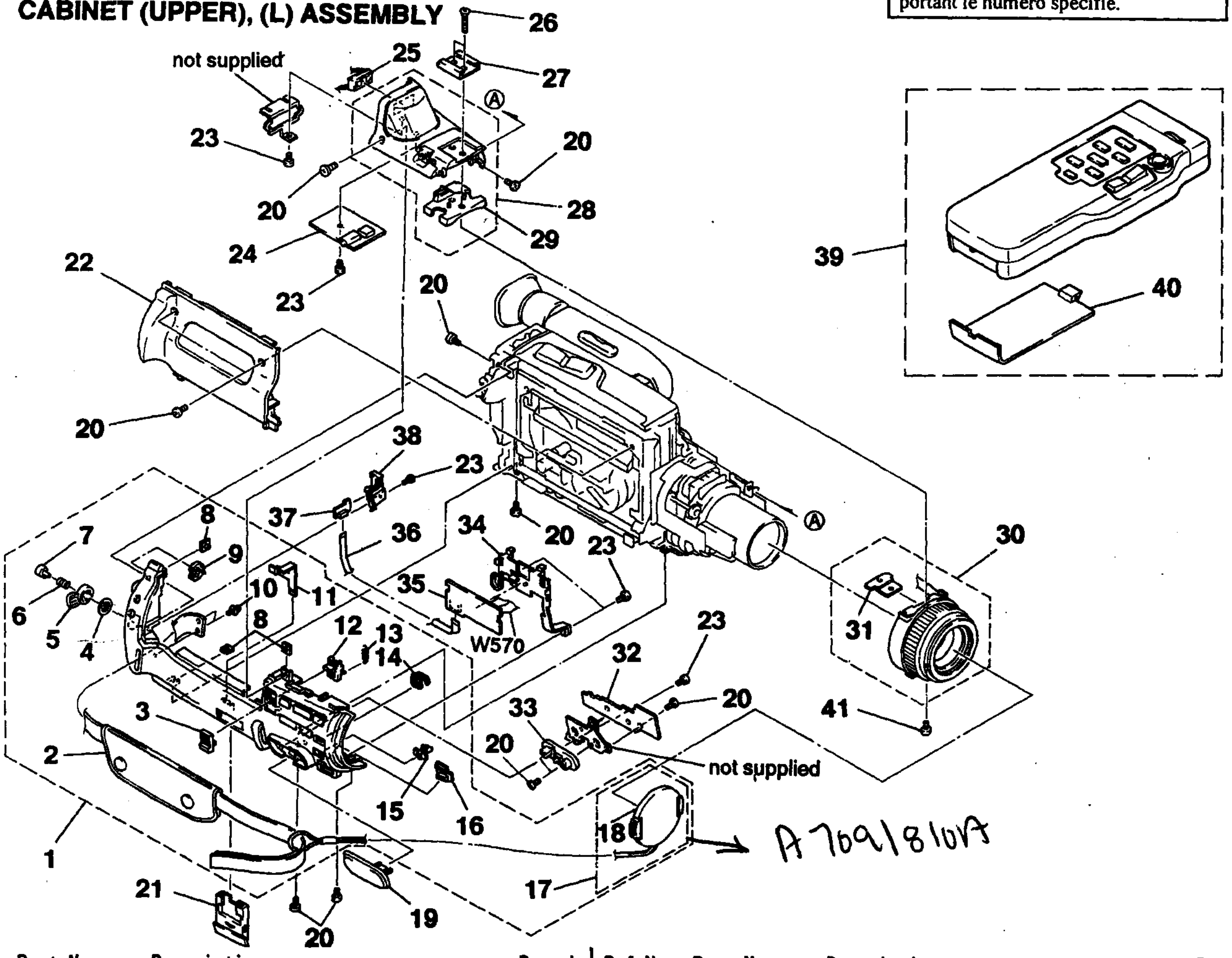
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

5-1. CABINET (UPPER), (L) ASSEMBLY

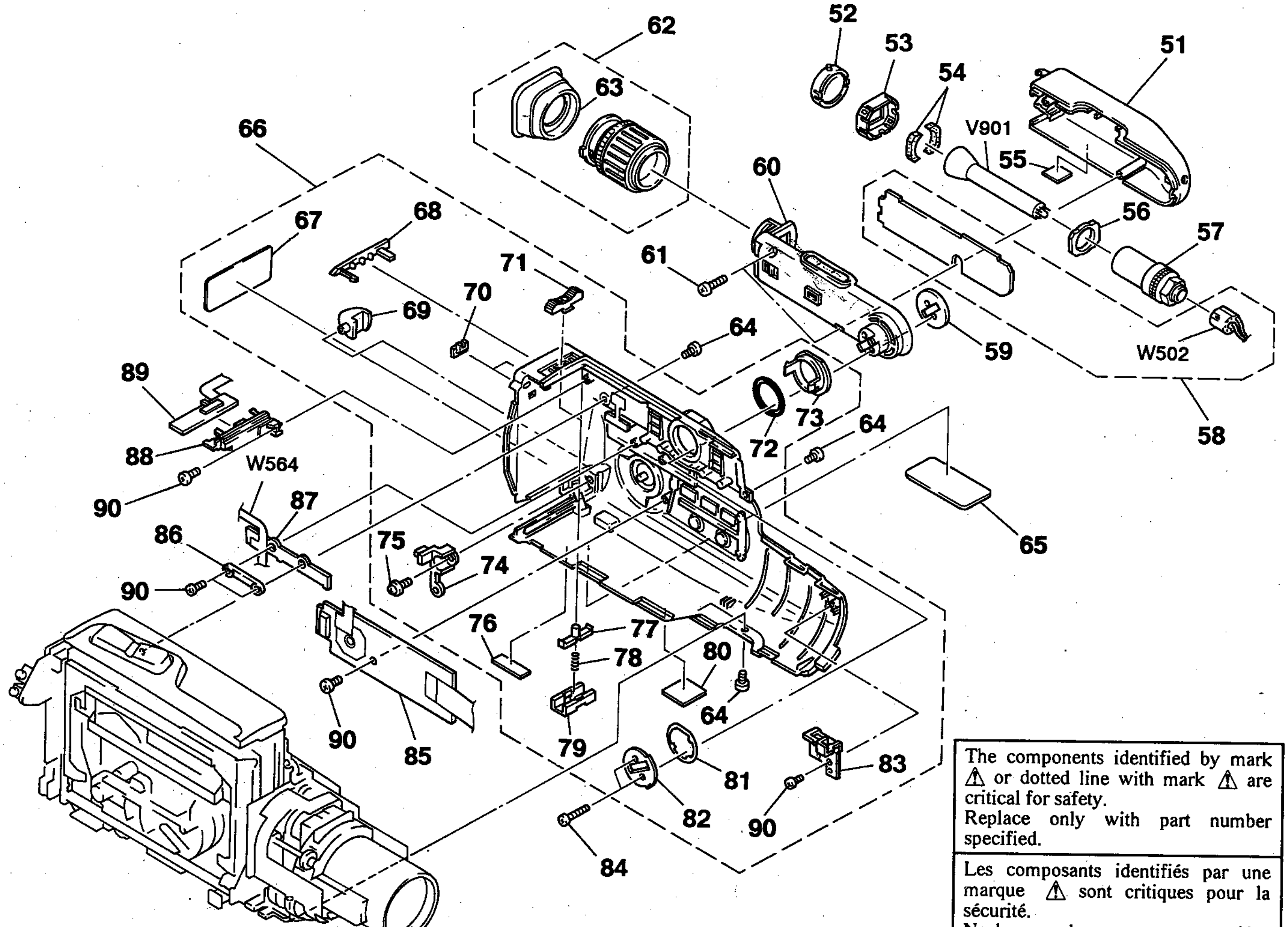


A7091810A

1. anode
2. cathode

Ref. No.	Part No.	Description	Remark
1	X-3941-315-1	CABINET (L) ASSY (FX410/FX400)	
1	X-3941-665-1	CABINET (L) ASSY (FX411)	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	4-602-490-00	SPRING, TENSION	
14	3-946-193-01	KNOB, REC	
15	3-946-187-01	BUTTON, EDIT	
16	3-946-261-01	BUTTON, INPUT OUTPUT	
17	~~A-7091-822-A~~	~~CAP~~ ASSY (2), HOOD	
18	~~X-7090-806-A~~	~~CAP, HOOD~~	
19	3-946-169-01	LID, JACK (FX410/FX400)	
19	3-946-169-11	LID, JACK (FX411)	
20	3-719-381-01	SCREW (M2X4)	
21	X-3941-541-1	HOLDER ASSY, LITHIUM (FX410/FX400)	
21	X-3941-664-1	HOLDER ASSY, LITHIUM (FX411)	
22	X-3941-313-1	LID ASSY, CASSETTE (FX410)	
22	X-3941-663-1	LID ASSY, CASSETTE (FX411)	
22	X-3941-661-1	LID ASSY, CASSETTE (FX400)	
23	3-713-790-01	SCREW (M2X5), TAPPING, P3	
24	A-7063-015-A	COMPLETE ASSY, MA-93	
25	1-542-126-41	MICROPHONE UNIT	
26	3-719-831-31	SCREW (M2X12)	
27	3-724-511-01	SHOE, ACCESSORY	
28	X-3941-321-1	CABINET (UPPER) ASSY (FX410/FX400)	
28	X-3941-666-1	CABINET (UPPER) ASSY (FX411)	
29	3-946-234-01	PRISM, REMOTE CONTROL	
30	1-241-771-11	RES, VAR (FOCUS RING)	
31	3-946-172-01	SHEET METAL, SHOE	
32	A-7071-547-A	PJ-45 BOARD, COMPLETE	
33	1-537-402-11	TERMINAL BOARD	
34	3-946-259-01	HOLDER, VK	
35	A-7071-542-A	VK-22 BOARD, COMPLETE	
36	1-690-604-11	CABLE, FLAT (FFC-33)	
37	A-7071-543-A	SW-200 BOARD, COMPLETE	
38	3-946-185-01	HOLDER, SW	
39	1-693-017-11	REMOTE COMMANDER (RMT-509)	
40	3-947-500-01	LID, BATTERY CASE	
41	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	

5-2. CABINET (R), EVF ASSEMBLY

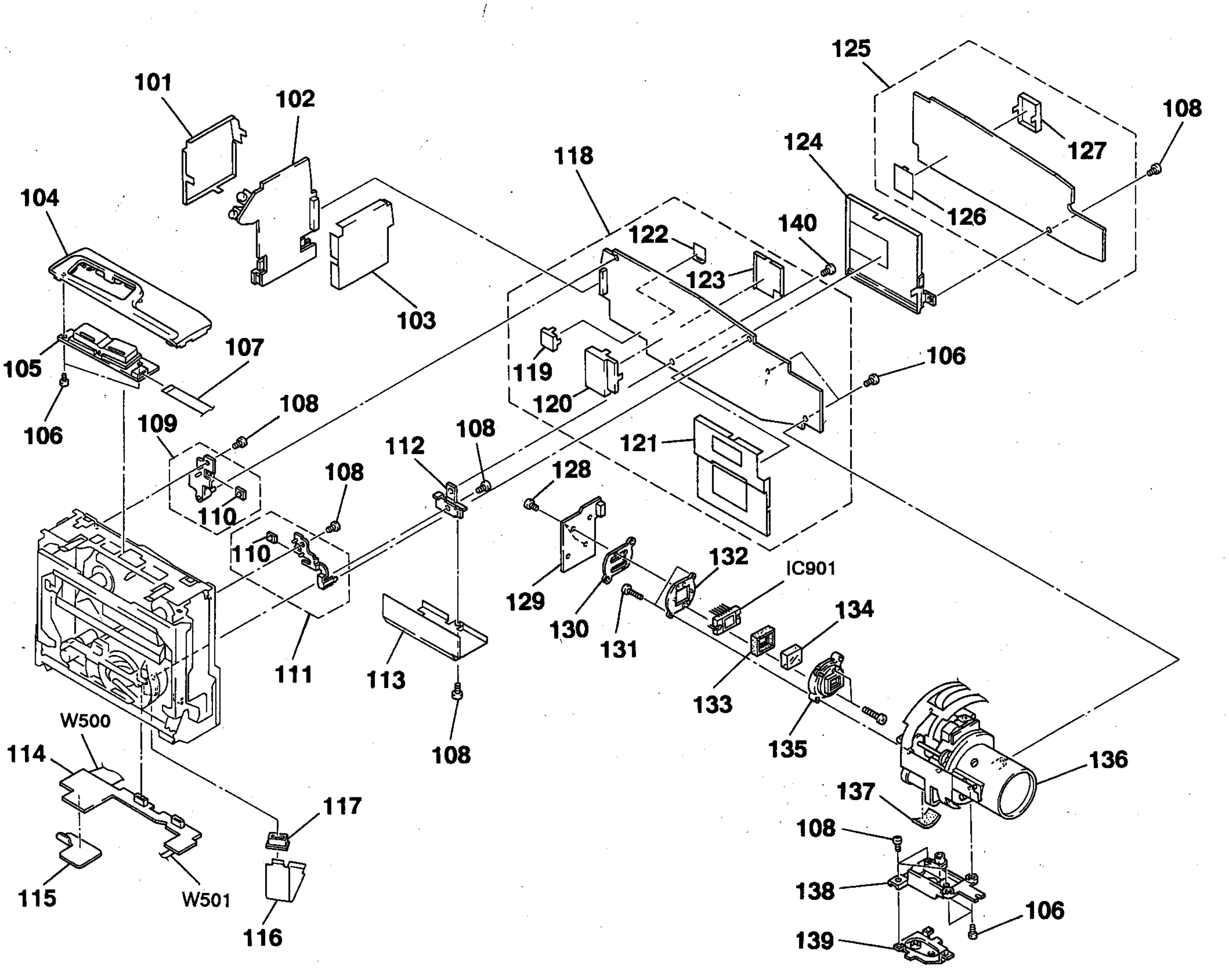


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
51	X-3941-319-1	CABINET (R) ASSY, EVF (FX410/FX400)	
51	X-3941-670-1	CABINET (R) ASSY, EVF (FX411)	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	3-703-848-01	LABEL (N), SUB CAUTION	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	A-7063-019-A	VF-44 BOARD, COMPLETE	
59	3-946-202-01	JOINT, EVF	
60	X-3941-318-1	CABINET (L) ASSY, EVF (FX410/FX400)	
60	X-3941-669-1	CABINET (L) ASSY, EVF (FX411)	
61	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-946-171-01	LABEL, MODEL NUMBER (FX410)	
* 65	3-948-098-01	LABEL, MODEL NUMBER (FX411)	
* 65	3-948-119-01	LABEL, MODEL NUMBER (FX400)	
66	X-3941-317-1	CABINET (R) ASSY (FX410:US)	
66	X-3941-500-1	CABINET (R) ASSY (FX410: Canadian)	
66	X-3941-667-1	CABINET (R) ASSY (FX411)	
66	X-3941-662-1	CABINET (R) ASSY (FX400)	
67	3-703-845-01	LABEL(N) (U/C),MAIN CAUTION (FX410/FX400)	
68	3-946-256-01	CAP, POWER (FX410/FX400)	
68	3-946-256-11	CAP, POWER (FX411)	
69	3-946-246-01	BUTTON, BATTERY RELEASE (FX410/FX400)	
69	3-946-246-11	BUTTON, BATTERY RELEASE (FX411)	
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-946-250-01	CLAW, BATTERY LOCK	
75	3-669-480-21	+ PTPWH 2	
* 76	3-704-367-01	LABEL (FX410:US/FX411)	
77	3-946-186-01	PUSH BUTTON, POWER	
78	3-303-973-00	SPRING, COMPRESSION	
79	3-946-249-01	PLATE, FUNCTION, POWER	
* 80	3-704-256-01	LABEL, CAUTION (FX410:US/FX411)	
81	3-946-255-01	SPRING, LEAF, TILT	
82	3-946-254-01	PLATE, LOCK, TILT	
83	3-947-315-01	PLATE, FIXED, CABINET	
84	3-740-546-21	SCREW (M2X10.5)	
85	A-7071-544-A	CK-47 BOARD, COMPLETE	
86	3-946-199-01	RETAINER, DK	
87	A-7071-545-A	DK-20 BOARD, COMPLETE	
88	3-946-198-01	RETAINER, PK	
89	A-7071-546-A	PK-30 BOARD, COMPLETE	
90	3-713-790-01	SCREW (M2X5), TAPPING, P3	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-526-978-51	SOCKET ASSY, CRT	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

5-3. MAIN BOARD ASSEMBLY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W500
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W501
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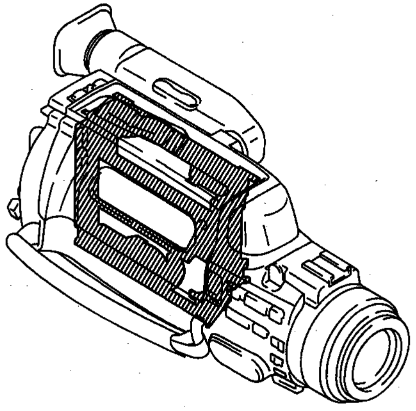
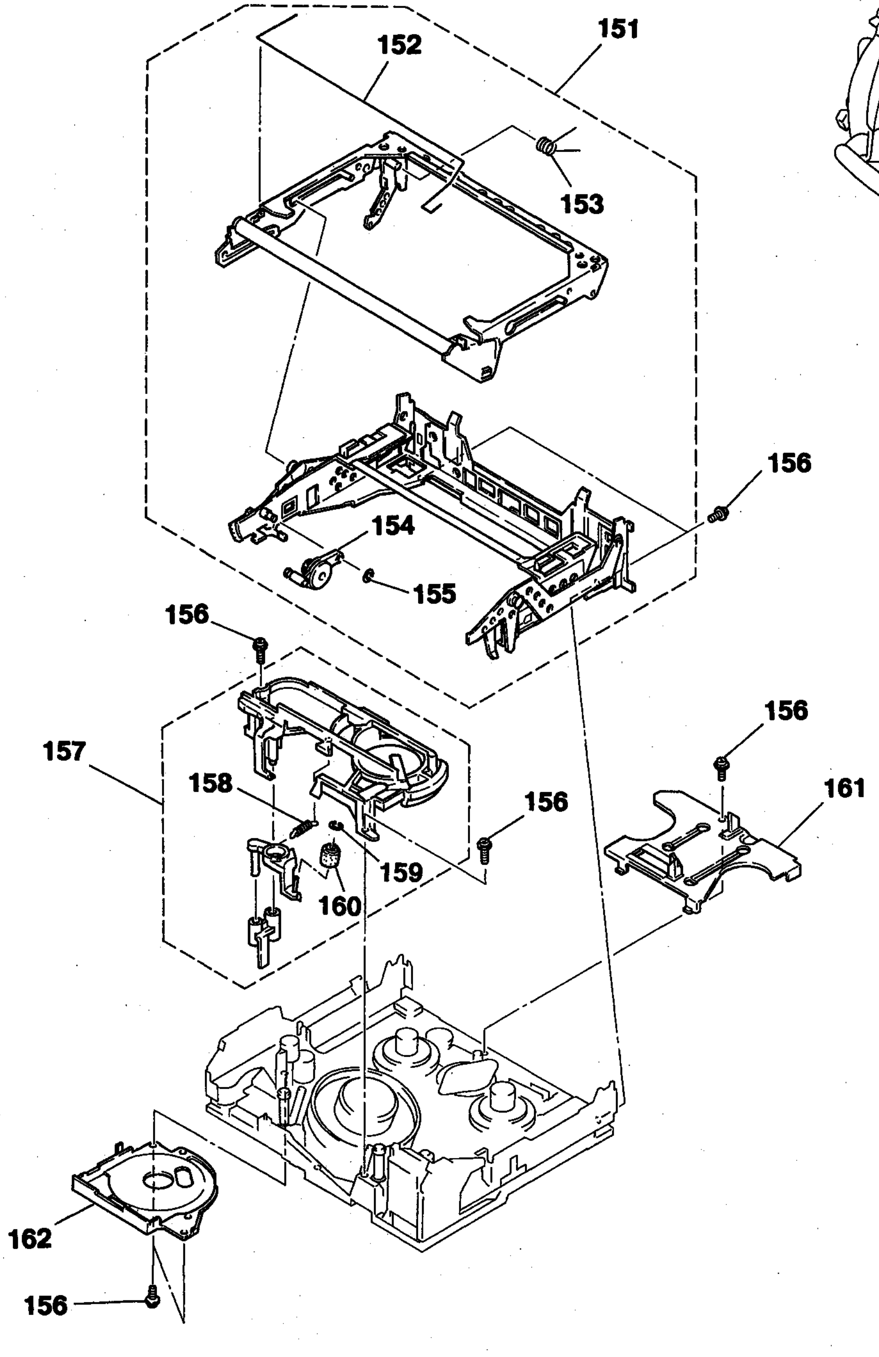
Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-010-A	PS-282 BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS (FX410/FX400)	
104	X-3941-668-1	LID ASSY, LS (FX411)	
105	1-692-025-11	SWITCH, PUSH	
106	3-713-790-01	SCREW (M2X5), TAPPING, P3	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-718-233-01	NUT, PLATE	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-011-A	SL-22 BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-007-A	CS-31 BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-946-177-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-008-A	VA-71 BOARD, COMPLETE	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-713-786-51	SCREW (M2X3)	
129	A-7063-005-A	CD-61 BOARD, COMPLETE	
* 130	3-749-945-01	SHEET, INSULATING, CCD	
131	3-747-151-21	SCREW (2X12)	
132	3-749-760-01	ADAPTOR, CCD FITTING	
133	3-749-739-01	RUBBER, SEAL	
134	1-547-445-11	FILTER BLOCK, OPTICAL	
135	3-941-342-11	HOLDER, CCD	
136	1-547-540-11	LENS, ZOOM ASSY (VCL-6110WA)	
137	3-947-630-01	SHEET, ZOOM RUBBER	
138	3-946-223-01	HOLDER (C), LENS	
139	3-946-224-01	SHEET METAL, TRIPOD	
140	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
IC901	8-752-606-79	IC ICX044BKA-2 (CCD IMAGER)	
W500	1-642-185-11	FP-425 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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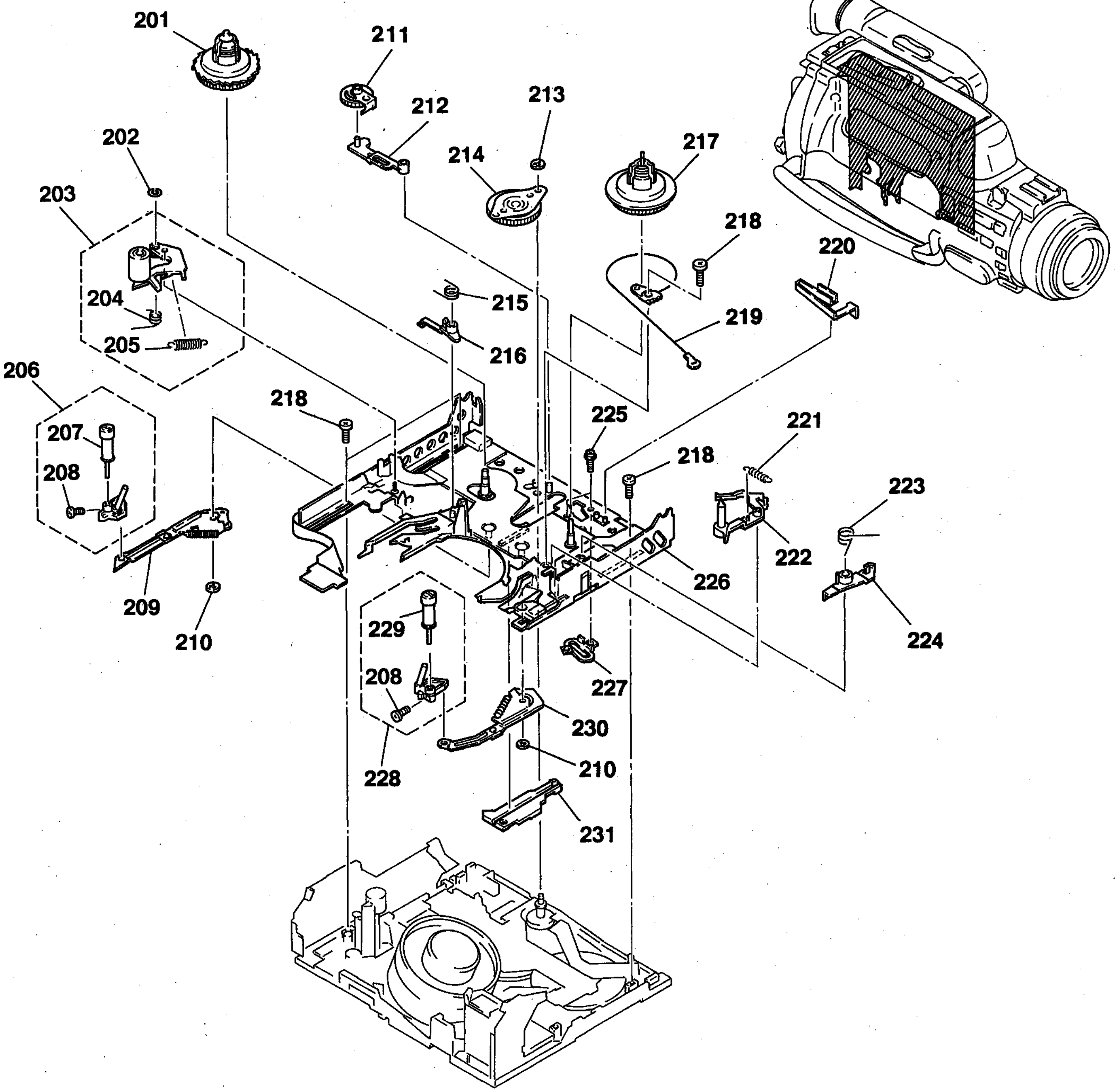
Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-1	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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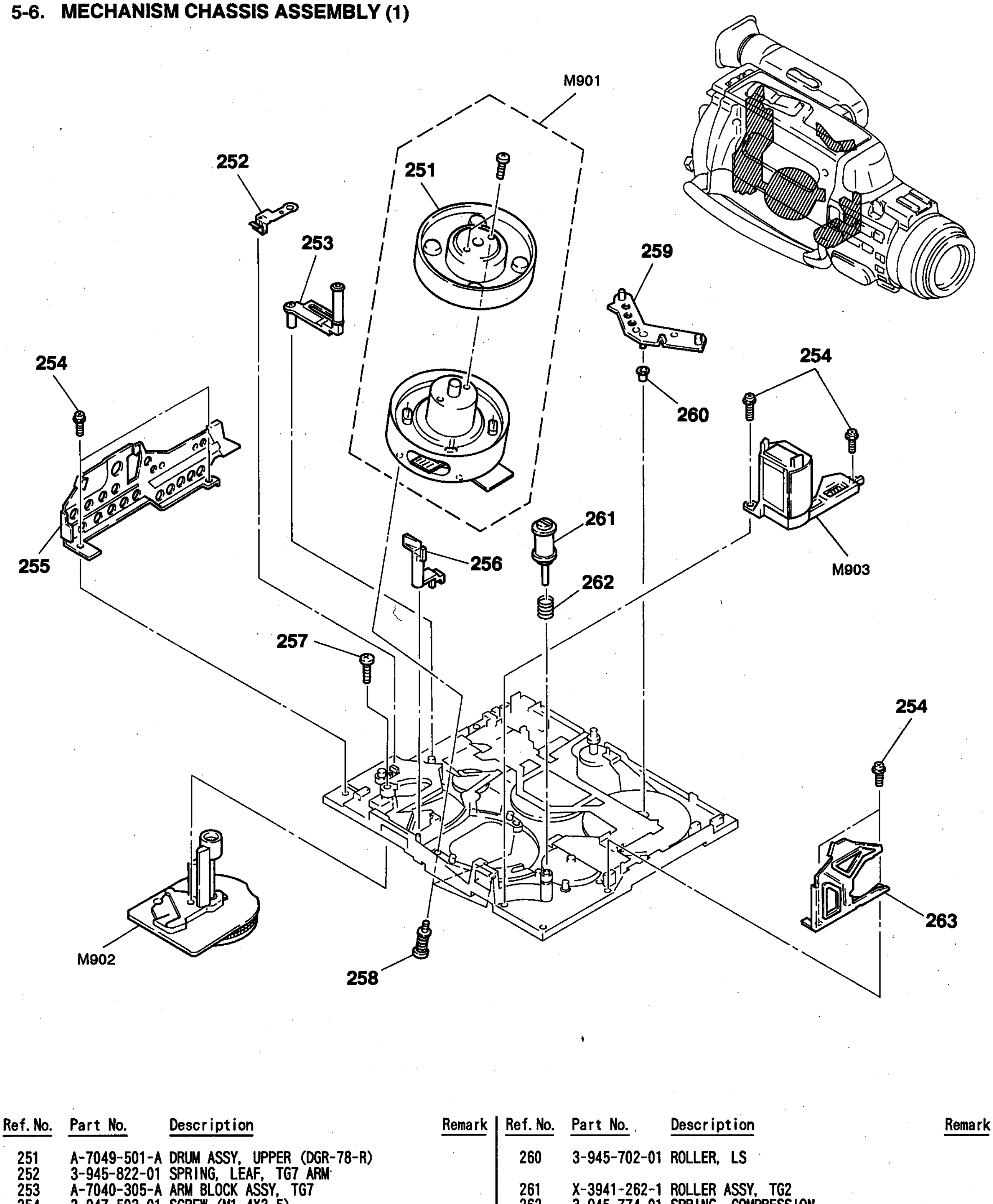
Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-945-755-01	SPRING, TORSION	
216	3-945-754-01	CLAW, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-947-170-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	

5-6. MECHANISM CHASSIS ASSEMBLY (1)



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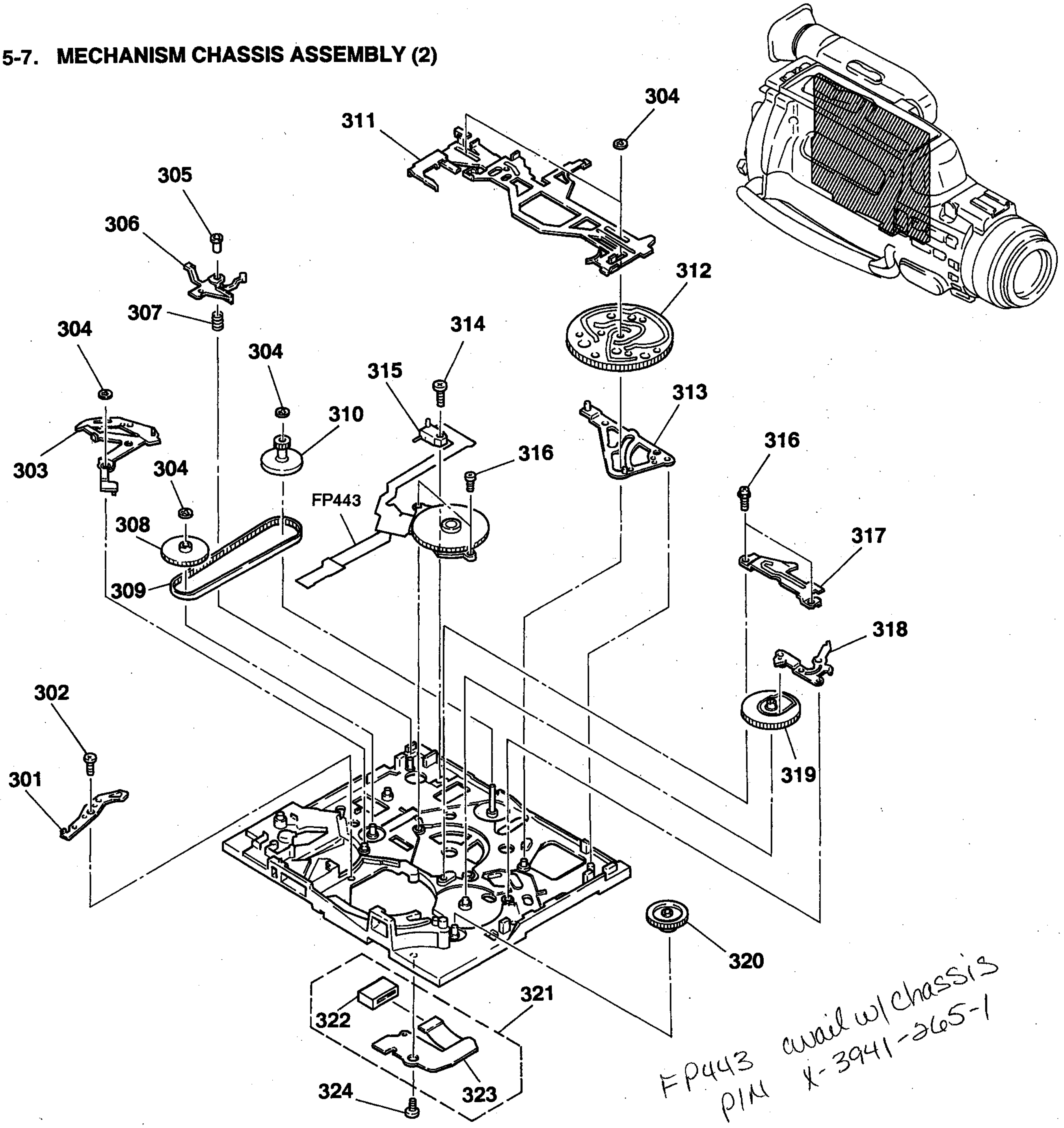
Ref. No.	Part No.	Description	Remark
251	A-7049-501-A	DRUM ASSY, UPPER (DGR-78-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	X-3941-383-1	SCREW ASSY, FITTING	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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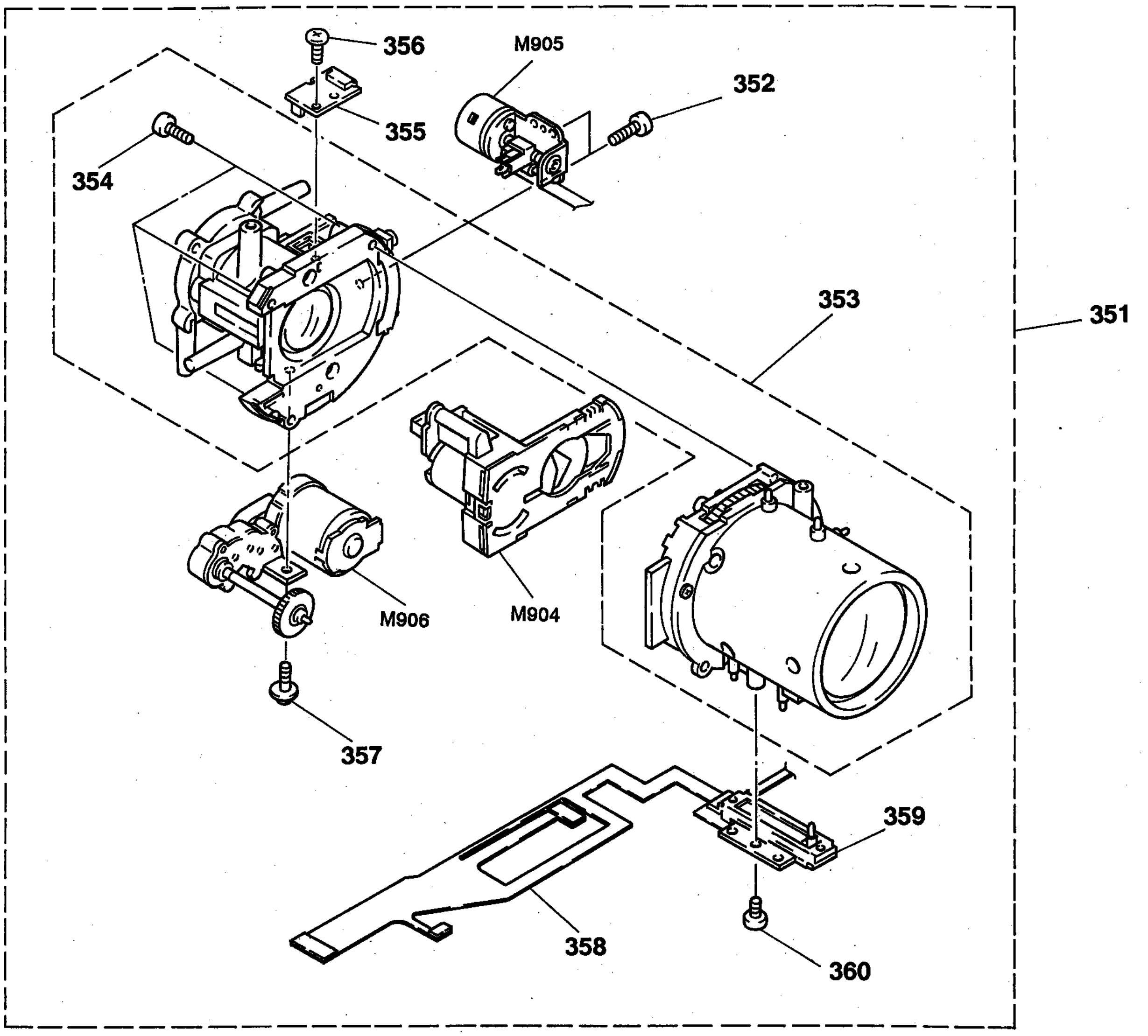
FP443 avail w/chassis
P/N X-3941-265-1

Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	1-572-987-11	SWITCH, PUSH (3 KEY)	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	1-691-254-12	CONNECTOR, TRANSLATION 10P	
323	1-641-643-12	FP-444 FLEXIBLE BOARD	
324	3-945-756-01	SCREW (M1.4X3)	

5-8. ZOOM LENZ ASSEMBLY (VCL-6110WA)



Ref. No.	Part No.	Description	Remark
351	1-547-540-11	LENS, ZOOM ASSY (VCL-6110WA)	
352	3-708-390-01	SCREW, FITTING, FOCUS MOTOR	
353	3-708-384-01	LENS ASSY	
354	3-708-386-01	SCREW, DOCKING	
355	3-708-391-01	FI BOARD	
356	3-708-392-01	SCREW, FITTING, FI BOARD	
357	3-708-388-01	SCREW, FITTING, ZOOM MOTOR	
358	3-708-395-01	RELAY FLEXIBLE BOARD	
359	3-708-393-01	POTENTIAL, ZOOM	
360	3-708-394-01	SCREW, FITTING, ZOOM POTENTIAL	
M904	3-708-385-01	IRIS ASSY	
M905	3-708-389-01	MOTOR ASSY, FOCUS	
M906	3-708-387-01	MOTOR ASSY, ZOOM	

SECTION 6
ELECTRICAL PARTS LIST

CD-61 **CK-47**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
	A-7063-005-A	CD-61 BOARD, COMPLETE	
		**********************	
		(Ref.NO 1000 Seriers)	
		< CAPACITOR >	
C901	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		< DIODE >	
D901	8-719-820-05	DIODE 1SS181	
D903	8-719-820-05	DIODE 1SS181	
D904	8-719-800-76	DIODE 1SS226	
		< COIL >	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
		< TRANSISTOR >	
Q901	8-729-602-21	TRANSISTOR 2SC4154-F	
Q902	8-729-402-13	TRANSISTOR XN1501	
Q903	8-729-232-86	TRANSISTOR 2SK1875-BL/V-TE85L	
		< RESISTOR >	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R903	1-216-819-11	METAL CHIP 680 5% 1/16W	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R906	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R914	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R915	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R916	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R917	1-216-864-11	METAL CHIP 0 5% 1/16W	
R918	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
		**	
	A-7071-544-A	CK-47 BOARD, COMPLETE	
		*********************	
		(Ref.NO 6000 Series)	
		< CAPACITOR >	
C561	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
		< CONNECTOR >	
* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		< DIODE >	
D560	8-719-820-05	DIODE 1SS181	
D561	8-719-404-46	DIODE MA110	
D562	8-719-110-03	DIODE RD7.5ES-B2	
D563	8-719-110-03	DIODE RD7.5ES-B2	
D564	8-719-110-03	DIODE RD7.5ES-B2	
D565	8-719-110-03	DIODE RD7.5ES-B2	
		< COIL >	
L560	1-412-028-11	INDUCTOR CHIP 4.7uH	

(RESISTOR)

Ref. No.	Part No.	Description			Remark
R561	1-216-857-11	METAL CHIP	1M	5%	1/16W
R562	1-216-857-11	METAL CHIP	1M	5%	1/16W
R563	1-216-270-00	METAL GLAZE	1M	5%	1/8W

(SWITCH)

Ref. No.	Part No.	Description	Remark
S560	1-692-024-11	SWITCH, ROTARY (PROGRAM AE)	
S564	1-692-112-11	SWITCH, TACTIL (DATE)	
S565	1-692-112-11	SWITCH, TACTIL (TIME)	
S566	1-692-112-11	SWITCH, TACTIL (AGE/EVENT)	
S567	1-692-111-11	SWITCH, KEY BOARD (BACK LIGHT)	
S568	1-692-111-11	SWITCH, KEY BOARD (FADER)	

(CABLE)

Ref. No.	Part No.	Description	Remark
W561	1-690-602-11	CABLE, FLAT (FFC-23)	

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A-7063-007-A CS-31 BOARD, COMPLETE

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(Ref. NO. 3000 Series)

Ref. No.	Part No.	Description	Remark
	X-3941-498-1	CASE (LID), SHIELD, CAMERA	
*	3-946-177-01	CASE (MAIN), SHIELD, RP	
*	3-946-178-01	CASE (LID), SHIELD, RP	
*	3-946-179-01	CASE (MAIN), SHIELD, FE	
*	3-946-180-01	CASE (LID), SHIELD, FE	

(CAPACITOR)

Ref. No.	Part No.	Description			Remark
C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C002	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C003	1-128-004-11	ELECT CHIP	10uF	20%	16V
C004	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C005	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C006	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C007	1-128-004-11	ELECT CHIP	10uF	20%	16V
C008	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C009	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C010	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C011	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C012	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C013	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C014	1-128-004-11	ELECT CHIP	10uF	20%	16V
C016	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C017	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C018	1-128-004-11	ELECT CHIP	10uF	20%	16V
C019	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C020	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C021	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C022	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C023	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C024	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C025	1-128-004-11	ELECT CHIP	10uF	20%	16V
C026	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C041	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C042	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C043	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C044	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C045	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C046	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C501	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C504	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C505	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C506	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C507	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C508	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C509	1-128-004-11	ELECT CHIP	10uF	20%	16V
C510	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C511	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C512	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C513	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C514	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C515	1-128-004-11	ELECT CHIP	10uF	20%	16V
C517	1-128-004-11	ELECT CHIP	10uF	20%	16V
C518	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C519	1-128-004-11	ELECT CHIP	10uF	20%	16V
C520	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C521	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C523	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C524	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C525	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V

Ref. No.	Part No.	Description			Remark
C526	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C527	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C528	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C529	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C530	1-162-911-11	CERAMIC CHIP	6PF	0.5PF	50V
C531	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C532	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C534	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C535	1-128-004-11	ELECT CHIP	10uF	20%	16V
C536	1-128-004-11	ELECT CHIP	10uF	20%	16V
C537	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C538	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C540	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C541	1-126-397-11	ELECT	33uF	20%	25V
C542	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C543	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V
C544	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V
C546	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C547	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C548	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C549	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C550	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C551	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C552	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C553	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C554	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C555	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C556	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C558	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C559	1-126-397-11	ELECT	33uF	20%	25V
C560	1-128-004-11	ELECT CHIP	10uF	20%	16V
C561	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C562	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C563	1-162-971-11	CERAMIC CHIP	0.001uF		50V
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C565	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C567	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C568	1-128-007-11	ELECT CHIP	2.2uF	20%	35V
C569	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C572	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C573	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C575	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V
C580	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C582	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C588	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C589	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C590	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C591	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C592	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C593	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C594	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C702	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C705	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C708	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C709	1-164-346-11	CERAMIC CHIP	1uF		16V
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C711	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C712	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C713	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C714	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C718	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C721	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C722	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C724	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C725	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C726	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C729	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C733	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C736	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C737	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C738	1-164-156-11	CERAMIC CHIP	0.1uF		25V

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Ref. No.	Part No.	Description			Remark
C739	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C741	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C751	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C752	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C754	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C803	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C810	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C811	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C813	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C819	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C826	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C828	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C831	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C834	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C840	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C851	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C852	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C853	1-162-638-11	CERAMIC CHIP	1uF		16V
C854	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C855	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C856	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C857	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C858	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C859	1-128-004-11	ELECT CHIP	10uF	20%	16V
C861	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C864	1-162-638-11	CERAMIC CHIP	1uF		16V
C865	1-128-153-21	ELECT CHIP	22uF	20%	6.3V
C866	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C868	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C869	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C870	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V
C872	1-162-638-11	CERAMIC CHIP	1uF		16V
C875	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
		〈 CONNECTOR 〉			
CN001	1-569-775-21	PIN, CONNECTOR 5P			
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P			
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P			
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P			
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P			
CN504	1-691-524-11	CONNECTOR, BOARD TO BOARD 20P			
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P			
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P			
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P			
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P			
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P			
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P			
		〈 TRIMMER 〉			
CT801	9-910-999-34	CAP, VAR, TRIMMER (CHIP) 6P			

Ref. No.	Part No.	Description	Remark
		(DIODE)	
⚠D501	8-719-421-27	DIODE MA728	
D502	8-719-404-46	DIODE MA110	
D503	8-719-110-03	DIODE RD7.5ES-B2	
D504	8-719-941-86	DIODE DAN202U	
D506	8-719-404-46	DIODE MA110	
D507	8-719-404-46	DIODE MA110	
		(FILTER)	
FL701	1-406-452-11	COIL, OSC	
		(IC)	
IC001	8-752-033-38	IC CXA1202R	
IC501	8-759-058-96	IC TB1206F-EL	
IC502	8-759-999-02	IC TL1596CDB	
IC503	8-752-833-85	IC CXP80624-262Q	
IC505	8-759-990-55	IC CXA8006M	
IC506	8-759-067-50	IC uPD75316GF-217-3BE	
IC507	8-759-511-22	IC CXA1448N	
IC508	8-759-512-69	IC S-81350HG-KD	
IC509	8-759-145-63	IC uPD7564G-540	
IC510	8-759-039-01	IC MPC1720M	
IC511	8-759-044-78	IC AK6420F	
IC702	8-759-635-27	IC M62352GP	
IC703	8-759-069-30	IC uPD6456GS-618-E2	
IC704	8-752-348-92	IC CXD2101AR-T6	
IC705	8-759-519-13	IC CXD2103R-T6	
IC706	8-752-337-36	IC CXD2104N	
IC707	8-752-337-32	IC CXD2100Q	
IC709	8-752-834-24	IC CXP80624-261Q	
IC712	8-759-044-78	IC AK6420F	
IC801	8-752-337-34	IC CXD1257R	
IC802	8-752-056-39	IC CXA1507BR	
IC803	8-752-053-26	IC CXA1399Q	
IC804	8-752-327-48	IC CXD1250N	
IC805	8-752-054-61	IC CXA1390AR	
IC851	8-759-981-82	IC RC3414M	
IC852	8-759-998-96	IC LM324D	
IC853	8-759-038-81	IC MPC1724M	
IC854	8-759-823-51	IC LB1830M	
IC855	8-759-998-98	IC LM358D	

Ref. No.	Part No.	Description	Remark
		(COIL)	
L001	1-412-033-11	INDUCTOR CHIP 220uH	
L002	1-412-033-11	INDUCTOR CHIP 220uH	
L003	1-412-033-11	INDUCTOR CHIP 220uH	
L004	1-412-029-11	INDUCTOR CHIP 10uH	
L041	1-412-033-11	INDUCTOR CHIP 220uH	
L042	1-410-381-11	INDUCTOR CHIP 10uH	
L501	1-412-029-11	INDUCTOR CHIP 10uH	
L502	1-412-029-11	INDUCTOR CHIP 10uH	
L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
L504	1-412-031-11	INDUCTOR CHIP 47uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L701	1-412-006-31	INDUCTOR CHIP 10uH	
L702	1-412-006-31	INDUCTOR CHIP 10uH	
L703	1-412-006-31	INDUCTOR CHIP 10uH	
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L706	1-412-029-11	INDUCTOR CHIP 10uH	
L714	1-412-011-31	INDUCTOR CHIP 27uH	
L715	1-412-029-11	INDUCTOR CHIP 10uH	
L716	1-412-026-11	INDUCTOR CHIP 1uH	
L717	1-412-029-11	INDUCTOR CHIP 10uH	
L719	1-412-006-31	INDUCTOR CHIP 10uH	
L722	1-412-006-31	INDUCTOR CHIP 10uH	
L723	1-410-391-11	INDUCTOR CHIP 68uH	
L730	1-412-026-11	INDUCTOR CHIP 1uH	
L731	1-412-026-11	INDUCTOR CHIP 1uH	
L732	1-412-026-11	INDUCTOR CHIP 1uH	
L733	1-412-979-21	INDUCTOR 1uH	
L734	1-412-979-21	INDUCTOR 1uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	
L803	1-412-029-11	INDUCTOR CHIP 10uH	
L804	1-412-029-11	INDUCTOR CHIP 10uH	
L851	1-412-029-11	INDUCTOR CHIP 10uH	
L852	1-410-993-11	INDUCTOR CHIP 1uH	
L853	1-412-029-11	INDUCTOR CHIP 10uH	
		(IC LINK)	
⚠PS501	1-576-123-21	RINK, IC	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

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(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q002	8-729-905-35	TRANSISTOR 2SC4081-R	
Q003	8-729-905-12	TRANSISTOR DTA144EU	
Q041	8-729-905-23	TRANSISTOR 2SA1576-R	
Q042	8-729-920-XX	TRANSISTOR DTA114EUT106	
Q043	8-729-216-22	TRANSISTOR 2SA1162-G	
Q501	8-729-907-00	TRANSISTOR DTC114EU	
Q502	8-729-402-78	TRANSISTOR XN6401	
Q503	8-729-905-35	TRANSISTOR 2SC4081-R	
Q504	8-729-921-08	TRANSISTOR DTC144TU	
Q505	8-729-905-23	TRANSISTOR 2SA1576-R	
Q506	8-729-905-18	TRANSISTOR DTC144EU	
Q507	8-729-905-12	TRANSISTOR DTA144EU	
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST	
Q510	8-729-402-81	TRANSISTOR XN4501	
Q511	8-729-402-81	TRANSISTOR XN4501	
Q702	8-729-402-84	TRANSISTOR XN4601	
Q703	8-729-602-36	TRANSISTOR 2SA1602-F	
Q704	8-729-602-36	TRANSISTOR 2SA1602-F	
Q707	8-729-927-XX	TRANSISTOR 2SC4617TL-QR	
Q708	8-729-920-XX	TRANSISTOR DTA114EUT106	
Q709	8-729-905-61	TRANSISTOR DTC124EU	
Q801	8-729-423-52	TRANSISTOR 2SC3931-C	
Q802	8-729-403-27	TRANSISTOR XN4401	
Q851	8-729-602-21	TRANSISTOR 2SC4154-F	
Q853	8-729-403-27	TRANSISTOR XN4401	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R001	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R003	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R004	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R005	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R006	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R007	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R008	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R009	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R011	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R012	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R013	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R014	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R015	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R018	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R019	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R020	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R021	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R022	1-216-864-11	METAL CHIP 0 5% 1/16W	
R023	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R024	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R026	1-216-817-11	METAL CHIP 470 5% 1/16W	
R041	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R042	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R043	1-216-814-11	METAL CHIP 270 5% 1/16W	
R044	1-216-813-11	METAL CHIP 220 5% 1/16W	
R045	1-216-803-11	METAL CHIP 33 5% 1/16W	
R046	1-216-806-11	METAL GLAZE 56 5% 1/16W	
R047	1-216-818-11	METAL CHIP 560 5% 1/16W	
R048	1-216-864-11	METAL CHIP 0 5% 1/16W	
R501	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R502	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R503	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R504	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R505	1-216-817-11	METAL CHIP 470 5% 1/16W	
R506	1-216-852-11	METAL CHIP 390K 5% 1/16W	
R507	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R508	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R509	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R513	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R515	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R516	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R517	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R518	1-216-809-11	METAL CHIP 100 5% 1/16W	
R520	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R521	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R522	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R523	1-216-864-11	METAL CHIP 0 5% 1/16W	
R524	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R526	1-216-821-11	METAL CHIP 1K 5% 1/16W	

Ref.No.	Part No.	Description				Remark
R527	1-216-295-00	METAL CHIP	0	5%	1/10W	
R528	1-216-295-00	METAL CHIP	0	5%	1/10W	
R530	1-216-864-11	METAL CHIP	0	5%	1/16W	
R531	1-216-864-11	METAL CHIP	0	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R540	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R541	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R543	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R544	1-216-815-11	METAL CHIP	330	5%	1/16W	
R545	1-216-039-00	METAL CHIP	390	5%	1/10W	
R546	1-216-864-11	METAL CHIP	0	5%	1/16W	
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R558	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R569	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R573	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R576	1-216-864-11	METAL CHIP	0	5%	1/16W	
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R581	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R585	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R586	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R587	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R589	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R591	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R592	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R600	1-216-809-11	METAL CHIP	100	5%	1/16W	
R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R602	1-216-864-11	METAL CHIP	0	5%	1/16W	
R603	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-295-00	METAL CHIP	0	5%	1/10W	
R609	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R704	1-216-815-11	METAL CHIP	330	5%	1/16W	
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R709	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R711	1-216-864-11	METAL CHIP	0	5%	1/16W	
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R713	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R714	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R715	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R720	1-216-864-11	METAL CHIP	0	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R727	1-216-821-11	METAL CHIP	1K	5%	1/16W	

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Ref. No.	Part No.	Description				Remark
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R729	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R730	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R732	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R734	1-216-809-11	METAL CHIP	100	5%	1/16W	
R735	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R737	1-216-813-11	METAL CHIP	220	5%	1/16W	
R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R739	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R740	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R741	1-216-864-11	METAL CHIP	0	5%	1/16W	
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R743	1-216-864-11	METAL CHIP	0	5%	1/16W	
R744	1-216-864-11	METAL CHIP	0	5%	1/16W	
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R747	1-216-864-11	METAL CHIP	0	5%	1/16W	
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-809-11	METAL CHIP	100	5%	1/16W	
R753	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R756	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R757	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R772	1-216-864-11	METAL CHIP	0	5%	1/16W	
R773	1-216-864-11	METAL CHIP	0	5%	1/16W	
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R777	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R781	1-216-864-11	METAL CHIP	0	5%	1/16W	
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R798	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R807	1-216-864-11	METAL CHIP	0	5%	1/16W	
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R815	1-216-864-11	METAL CHIP	0	5%	1/16W	
R819	1-216-805-11	METAL CHIP	47	5%	1/16W	
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R836	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R858	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R863	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R864	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R865	1-218-879-11	METAL CHIP 22K 0.50% 1/16W	
R866	1-216-820-11	METAL CHIP 820 5% 1/16W	
R867	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R868	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R869	1-218-744-11	METAL CHIP 150K 0.50% 1/16W	
R870	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R871	1-218-871-11	METAL CHIP 10K 0.50% 1/16W	
R872	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R873	1-216-816-11	METAL CHIP 390 5% 1/16W	
R874	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R875	1-216-134-00	METAL CHIP 2.2 5% 1/8W	
R876	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R877	1-218-881-11	METAL CHIP 27K 0.50% 1/16W	
R880	1-216-864-11	METAL CHIP 0 5% 1/16W	
R881	1-216-864-11	METAL CHIP 0 5% 1/16W	
R882	1-216-864-11	METAL CHIP 0 5% 1/16W	
R883	1-216-864-11	METAL CHIP 0 5% 1/16W	
R884	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R885	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	

〈 RESISTOR BLOCK 〉

Ref. No.	Part No.	Description	Remark
RB501	1-236-412-11	NETWORK, RES 1.0K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB503	1-236-412-11	NETWORK, RES 1.0K	
RB504	1-236-442-11	NETWORK, RES 330K	
RB505	1-236-420-11	NETWORK, RES 4.7K	
RB506	1-236-424-11	NETWORK, RES 10K	
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB510	1-236-432-11	NETWORK, RES 47K	
RB512	1-236-424-11	NETWORK, RES 10K	
RB513	1-236-432-11	NETWORK, RES 47K	
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB517	1-236-436-11	NETWORK, RES 100K	
RB518	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB519	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB520	1-236-412-11	NETWORK, RES 1.0K	
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-420-11	NETWORK, RES 4.7K	
RB530	1-236-420-11	NETWORK, RES 4.7K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	
RB740	1-236-432-11	NETWORK, RES 47K	

〈 CRYSTAL 〉

Ref. No.	Part No.	Description	Remark
X501	1-579-367-21	VIBRATOR, CRYSTAL 11.89MHz	
X502	1-579-550-11	VIBRATOR, CRYSTAL 32KHz	
X503	1-578-713-21	VIBLATOR, CERAMIC 4.19MHz	
X504	1-579-551-11	VIBRATOR, CERAMIC 700KHz	
X701	1-579-553-11	VIBRATOR 10MHz	
X801	1-579-042-11	VIBRATOR, CRYSTAL 28.6363MHz	

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A-7071-545-A DK-20 BOARD, COMPLETE
****
(Ref. NO. 7000 Series)

〈 RESISTOR 〉

Ref. No.	Part No.	Description	Remark
R564	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R565	1-216-857-11	METAL CHIP 1M 5% 1/16W	

〈 SWITCH 〉

Ref. No.	Part No.	Description	Remark
S561	1-692-112-11	SWITCH, TACTIL (COUNTER RESET)	
S562	1-692-112-11	SWITCH, TACTIL (ZEROMEM)	
S563	1-692-112-11	SWITCH, TACTIL (TAPE BATT CHECK)	

〈 FLEXIBLE BOARD 〉

Ref. No.	Part No.	Description	Remark
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

Ref. No.	Part No.	Description				Remark
		**				
	A-7063-015-A	MA-93 BOARD, COMPLETE				
		*********************				
		(Ref. NO. 3000 Series)				
	1-690-603-11	CABLE, FLAT (FFC-25)				
		〈 CAPACITOR 〉				
C400	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C401	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C402	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C403	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C404	1-162-587-11	CERAMIC CHIP	0.039uF	10%	25V	
C405	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C406	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C407	1-162-638-11	CERAMIC CHIP	1uF		16V	
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C411	1-162-638-11	CERAMIC CHIP	1uF		16V	
C412	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C415	1-162-638-11	CERAMIC CHIP	1uF		16V	
C417	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V	
		〈 CONNECTOR 〉				
CN400	1-580-057-11	PIN, CONNECTOR 4P				
		〈 DIODE 〉				
D400	8-719-110-03	DIODE	RD7.5ES-B2			
D401	8-719-110-03	DIODE	RD7.5ES-B2			
		〈 IC 〉				
IC400	8-759-822-37	IC	LA7293M-TE-L			
IC401	8-749-923-29	IC	RS-20E-T			
		〈 JACK 〉				
J400	1-568-027-11	JACK, SMALL TYPE 1P (EXT MIC)				
		〈 COIL 〉				
L400	1-410-993-11	INDUCTOR CHIP	1uH			
L401	1-410-993-11	INDUCTOR CHIP	1uH			

Ref. No.	Part No.	Description				Remark
		〈 TRANSISTOR 〉				
Q400	8-729-905-23	TRANSISTOR	2SA1576-R			
		〈 RESISTOR 〉				
R400	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R401	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R402	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R403	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R404	1-216-864-11	METAL CHIP	0	5%	1/16W	
R405	1-216-864-11	METAL CHIP	0	5%	1/16W	
R407	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R410	1-216-296-00	METAL CHIP	0	5%	1/8W	
R411	1-216-295-00	METAL CHIP	0	5%	1/10W	
R412	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R413	1-216-295-00	METAL CHIP	0	5%	1/10W	
R414	1-216-864-11	METAL CHIP	0	5%	1/16W	
		**				
	A-7071-547-A	PJ-45 BOARD, COMPLETE				
		*********************				
		(Ref. NO. 9000 Series)				
		〈 BUZZER 〉				
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC				
		〈 CAPACITOR 〉				
C550	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C551	1-164-346-11	CERAMIC CHIP	1uF		16V	
C552	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C553	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
		〈 CONNECTOR 〉				
CN550	1-691-491-21	CONNECTOR, FFC/FPC 12P				
		〈 DIODE 〉				
D550	8-719-404-46	DIODE	MA110			
D551	8-719-110-03	DIODE	RD7.5ESB2			
D552	8-719-110-03	DIODE	RD7.5ESB2			

Ref. No.	Part No.	Description			Remark
		(JACK)			
J501	1-537-402-11	TERMINAL BOARD (IN/OUT)			
		(RESISTOR)			
R552	1-216-295-00	METAL CHIP	0	5%	1/10W
		(SWITCH)			
S550	1-571-275-31	SWITCH, SLIDE (EDIT)			
S551	1-571-674-11	SWITCH, SLIDE (IN/OUT)			

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A-7071-546-A PK-30 BOARD, COMPLETE
****
(Ref.NO 8000 Series)

		(CONNECTOR)	
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	
		(DIODE)	
D540	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S540	1-572-283-11	SWITCH, SLIDE (POWER)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	
S542	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER)	

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A-7063-010-A PS-282 BOARD, COMPLETE
****
(Ref.NO.3000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description			Remark
C948	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C949	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C950	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C951	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C952	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C953	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C954	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C957	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C958	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C959	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C960	1-164-730-11	CERAMIC CHIP	0.0012uF	5%	50V
C961	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C962	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C963	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C965	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C966	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C968	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C969	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C970	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C971	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C972	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C973	1-128-530-11	ELECT CHIP	33uF	20%	10V
C974	1-128-004-11	ELECT CHIP	10uF	20%	16V
C975	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C976	1-128-004-11	ELECT CHIP	10uF	20%	16V
C977	1-128-530-11	ELECT CHIP	33uF	20%	10V
C978	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C979	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C980	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C981	1-164-830-11	CERAMIC CHIP	1uF	22%	16V
C982	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C983	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C984	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C985	1-128-004-11	ELECT CHIP	10uF	20%	16V
C986	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C987	1-128-004-11	ELECT CHIP	10uF	20%	16V
C988	1-128-530-11	ELECT CHIP	33uF	20%	10V
C989	1-128-530-11	ELECT CHIP	33uF	20%	10V
C990	1-164-346-11	CERAMIC CHIP	1uF		16V
C991	1-164-346-11	CERAMIC CHIP	1uF		16V
C992	1-128-004-11	ELECT CHIP	10uF	20%	16V
C993	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C994	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C995	1-128-530-11	ELECT CHIP	33uF	20%	10V
C996	1-128-004-11	ELECT CHIP	10uF	20%	16V
C997	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C998	1-128-530-11	ELECT CHIP	33uF	20%	10V

PS-282

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	
		(DIODE)	
D950	8-719-989-33	DIODE FC806-TL	
D952	8-719-110-03	DIODE RD7.5ES-B2	
D953	8-719-110-03	DIODE RD7.5ES-B2	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES-B2	
D963	8-719-110-03	DIODE RD7.5ES-B2	
D964	8-719-404-46	DIODE MA110	
		(FUSE)	
F950	1-532-778-21	FUSE, MICRO 1.6A 125V	
F951	1-532-778-21	FUSE, MICRO 1.6A 125V	
		(IC)	
⚠IC950	8-759-517-40	IC MB3785PFV	
		(JACK)	
J950	1-537-281-31	TERMINAL BOARD	
J951	1-565-276-21	JACK, ULTRA SMALL 1P	
J952	1-568-027-11	JACK, SMALL TYPE 1P	
		(COIL)	
L950	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L951	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L952	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L953	1-424-519-21	COIL, MOLD CHOKE	1.0uH
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	

Ref. No.	Part No.	Description	Remark
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L968	1-412-979-21	INDUCTOR 1uH	
L972	1-412-979-21	INDUCTOR 1uH	
L973	1-412-026-11	INDUCTOR CHIP 1uH	
L974	1-412-979-21	INDUCTOR 1uH	
L976	1-412-026-11	INDUCTOR CHIP 1uH	
		(TRANSISTOR)	
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-ST-TD	
Q952	8-729-823-84	TRANSISTOR PHOTO COUPLER FP102	
Q953	8-729-823-82	TRANSISTOR PHOTO COUPLER FP101	
Q954	8-729-823-82	TRANSISTOR PHOTO COUPLER FP101	
Q955	8-729-905-12	TRANSISTOR DTA144EU	
Q957	8-729-011-26	TRANSISTOR 2SJ179-T1	
Q958	8-729-920-48	TRANSISTOR IMH2	
Q959	8-729-011-26	TRANSISTOR 2SJ179-T1	
Q960	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R955	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R956	1-218-347-11	METAL GLAZE 91K 5% 1/16W	
R957	1-218-332-11	METAL GLAZE 130K 5% 1/16W	
R958	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R959	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R960	1-216-696-11	METAL CHIP 75K 0.5% 1/10W	
R961	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R962	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R964	1-216-679-11	METAL CHIP 15K 0.5% 1/10W	
R965	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R966	1-216-665-11	METAL CHIP 3.9K 0.5% 1/10W	
R967	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R968	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R969	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R970	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
R971	1-216-676-11	METAL CHIP 11K 0.5% 1/10W	
R972	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R973	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R974	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R975	1-216-176-00	METAL GLAZE 120 5% 1/8W	
R976	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R977	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R978	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R979	1-216-295-00	METAL CHIP 0 5% 1/10W	
R980	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R981	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R982	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R983	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R984	1-216-681-11	METAL CHIP 18K 0.5% 1/10W	
R985	1-216-687-11	METAL CHIP 33K 0.5% 1/10W	
R986	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R987	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R988	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R989	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R990	1-216-296-00	METAL CHIP 0 5% 1/8W	

〈 TRANSFORMER 〉

Ref. No.	Part No.	Description	Remark
T950	1-450-768-21	TRANSFORMER, CONVERTER	

〈 CRYSTAL 〉

Ref. No.	Part No.	Description	Remark
X950	1-579-467-11	VIBRATOR, CERAMIC 475KHz	

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A-7063-011-A SL-22 BOARD, COMPLETE

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(Ref.NO.3000 Series)

〈 CAPACITOR 〉

Ref. No.	Part No.	Description	Remark
C500	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C503	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C504	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C505	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C506	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C507	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	

〈 CONNECTOR 〉

Ref. No.	Part No.	Description	Remark
CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P	

〈 IC 〉

Ref. No.	Part No.	Description	Remark
IC501	8-759-059-09	IC LB8111V-TE-L	

〈 TRANSISTOR 〉

Ref. No.	Part No.	Description	Remark
Q501	8-729-402-81	TRANSISTOR XN4501	

〈 RESISTOR 〉

Ref. No.	Part No.	Description	Remark
R501	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R512	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R519	1-216-864-11	METAL CHIP 0 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0 5% 1/16W	

〈 RESISTOR BLOCK 〉

Ref. No.	Part No.	Description	Remark
RB500	1-236-424-11	NETWORK, RES 10K	
RB502	1-236-424-11	NETWORK, RES 10K	

〈 FLEXIBLE BOARD 〉

Ref. No.	Part No.	Description	Remark
W500	1-642-185-11	FP-425 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

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A-7071-543-A SW-200 BOARD, COMPLETE

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(Ref.NO.5000 Series)

〈 CONNECTOR 〉

Ref. No.	Part No.	Description	Remark
CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P	

〈 RESISTOR 〉

Ref. No.	Part No.	Description	Remark
R580	1-216-857-11	METAL CHIP 1M 5% 1/16W	

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)			
S581	1-571-275-31	SWITCH, SLIDE (STAND BY)			

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A-7063-008-A VA-71 BOARD, COMPLETE
****
(Ref.NO.2000 Series)

Ref. No.	Part No.	Description			Remark
*	3-946-181-01	CASE (MAIN), SHIELD, VA			
*	3-946-182-01	CASE (LID), SHIELD, VA			
		< CAPACITOR >			
C052	1-162-638-11	CERAMIC CHIP	1uF		16V
C053	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C054	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C055	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C056	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C057	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C058	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C059	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C060	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C061	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C062	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C064	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C066	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C070	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C071	1-128-003-11	ELECT CHIP	22uF	20%	4V
C072	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C073	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C074	1-128-004-11	ELECT CHIP	10uF	20%	16V
C075	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C077	1-128-004-11	ELECT CHIP	10uF	20%	16V
C078	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C090	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C091	1-128-004-11	ELECT CHIP	10uF	20%	16V
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C093	1-164-506-11	CERAMIC CHIP	4.7uF		16V
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C109	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C118	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C122	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C125	1-164-382-11	CERAMIC CHIP	91PF	5%	50V
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C202	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C223	1-128-004-11	ELECT CHIP	10uF	20%	16V
C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C226	1-128-004-11	ELECT CHIP	10uF	20%	16V
C227	1-128-004-11	ELECT CHIP	10uF	20%	16V
C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C230	1-126-246-11	ELECT CHIP	220uF	20%	4V
C231	1-128-004-11	ELECT CHIP	10uF	20%	16V
C232	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V
C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C252	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V
C256	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C257	1-126-207-11	ELECT CHIP	33uF	20%	4V
C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V
C261	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C271	1-164-458-11	CERAMIC CHIP	43PF	5%	50V
C273	1-126-607-11	ELECT CHIP	47uF	20%	4V
C274	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C277	1-128-004-11	ELECT CHIP	10uF	20%	16V
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V
C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C306	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C308	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V
C311	1-126-192-11	ELECT CHIP	0.68uF	20%	50V
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C314	1-128-004-11	ELECT CHIP	10uF	20%	16V
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C316	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V
C320	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C323	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C337	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C400	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C406	1-164-346-11	CERAMIC CHIP	1uF		16V

Ref. No.	Part No.	Description			Remark
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C428	1-126-607-11	ELECT CHIP	47uF	20%	4V
C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C430	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V
C431	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C432	1-164-346-11	CERAMIC CHIP	1uF		16V
C434	1-164-346-11	CERAMIC CHIP	1uF		16V
C435	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C439	1-164-346-11	CERAMIC CHIP	1uF		16V
C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C444	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C446	1-128-013-11	ELECT CHIP	1uF	20%	50V
C448	1-128-004-11	ELECT CHIP	10uF	20%	16V
C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C456	1-164-346-11	CERAMIC CHIP	1uF		16V
C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C461	1-126-607-11	ELECT CHIP	47uF	20%	4V
C490	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C494	1-128-006-11	ELECT CHIP	4.7uF	20%	25V
C498	1-128-003-11	ELECT CHIP	22uF	20%	4V
C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V

〈 FILTER 〉

Ref. No.	Part No.	Description	Remark
CF301	1-579-370-11	FILTER, CERAMIC	

〈 CONNECTOR 〉

Ref. No.	Part No.	Description	Remark
CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P	
CN202	1-691-476-21	CONNECTOR, BOARD TO BOARD 20P	
CN400	1-691-487-21	CONNECTOR, FFC/FPC 8P	

〈 DIODE 〉

Ref. No.	Part No.	Description		Remark
D102	8-719-800-76	DIODE	1SS226	
D201	8-719-941-86	DIODE	DAN202U	
D202	8-719-941-86	DIODE	DAN202U	
D203	8-719-941-09	DIODE	DAP202U	
D205	8-719-941-86	DIODE	DAN202U	
D206	8-719-941-86	DIODE	DAN202U	
D401	8-719-017-74	DIODE	MA8027-TX	

〈 FILTER 〉

Ref. No.	Part No.	Description	Remark
FL051	1-236-757-21	FILTER, LOW PASS (C)	
FL053	1-236-834-21	FILTER, LOW PASS	
FL054	1-415-751-21	DELAY LINE, LC (YH)	
FL201	1-239-113-21	FILTER, LOW PASS (REC.Y)	
FL301	1-236-575-11	B.P.F (PAL-M)	
FL302	1-236-146-11	FILTER, BAND PASS	

〈 IC 〉

Ref. No.	Part No.	Description		Remark
IC051	8-752-332-68	IC	CXL5502M-1-T3	
IC052	8-759-710-29	IC	NJM2235M	
IC053	8-759-031-84	IC	SC7S04F	
IC054	8-752-053-21	IC	CXA1211M	
IC201	8-752-036-19	IC	CXA1207AR-T5	
IC202	8-759-710-29	IC	NJM2235M	
IC203	8-759-055-82	IC	M62353GP	
IC204	8-759-055-82	IC	M62353GP	
IC205	8-759-636-33	IC	CXA1452	
IC206	8-752-053-21	IC	CXA1211M	
IC301	8-752-036-20	IC	CXA1208R	
IC400	8-759-234-77	IC	TC4S66F	
IC401	8-759-823-19	IC	CXA1488R-T4	

〈 COIL 〉

Ref. No.	Part No.	Description		Remark
L051	1-412-026-11	INDUCTOR CHIP	1uH	
L052	1-412-031-11	INDUCTOR CHIP	47uH	
L053	1-412-029-11	INDUCTOR CHIP	10uH	
L054	1-410-656-11	INDUCTOR CHIP	150uH	
L090	1-412-029-11	INDUCTOR CHIP	10uH	
L101	1-412-029-11	INDUCTOR CHIP	10uH	
L102	1-410-385-11	INDUCTOR CHIP	22uH	
L103	1-412-280-31	INDUCTOR	330uH	

Ref. No.	Part No.	Description	Remark
L104	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L109	1-410-657-21	INDUCTOR CHIP 180uH	
L110	1-410-387-11	INDUCTOR CHIP 33uH	
L113	1-410-381-11	INDUCTOR CHIP 10uH	
L114	1-410-380-31	INDUCTOR CHIP 8. 2uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-655-31	INDUCTOR CHIP 120uH	
L202	1-412-031-11	INDUCTOR CHIP 47uH	
L203	1-412-029-11	INDUCTOR CHIP 10uH	
L204	1-410-393-11	INDUCTOR CHIP 100uH	
L205	1-410-375-11	INDUCTOR CHIP 3. 3uH	
L207	1-410-390-11	INDUCTOR CHIP 56uH	
L208	1-410-389-31	INDUCTOR CHIP 47uH	
L210	1-410-370-31	INDUCTOR CHIP 1. 2uH	
L211	1-410-390-11	INDUCTOR CHIP 56uH	
L213	1-410-383-31	INDUCTOR CHIP 15uH	
L301	1-410-385-11	INDUCTOR CHIP 22uH	
L302	1-410-385-11	INDUCTOR CHIP 22uH	
L303	1-410-393-11	INDUCTOR CHIP 100uH	
L304	1-410-379-21	INDUCTOR CHIP 6. 8uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L308	1-410-393-11	INDUCTOR CHIP 100uH	
L400	1-410-384-31	INDUCTOR CHIP 18uH	
L990	1-412-026-11	INDUCTOR CHIP 1uH	

〈 TRANSISTOR 〉

Ref. No.	Part No.	Description	Remark
Q051	8-729-920-48	TRANSISTOR IMH2	
Q052	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q053	8-729-905-23	TRANSISTOR 2SA1576-R	
Q055	8-729-905-35	TRANSISTOR 2SC4081-R	
Q057	8-729-905-35	TRANSISTOR 2SC4081-R	
Q060	8-729-905-35	TRANSISTOR 2SC4081-R	
Q061	8-729-905-35	TRANSISTOR 2SC4081-R	
Q063	8-729-422-54	TRANSISTOR XN4215	
Q064	8-729-905-35	TRANSISTOR 2SC4081-R	
Q065	8-729-905-35	TRANSISTOR 2SC4081-R	
Q066	8-729-905-23	TRANSISTOR 2SA1576-R	
Q067	8-729-905-96	TRANSISTOR DTA114TU	
Q103	8-729-905-35	TRANSISTOR 2SC4081-R	

Ref. No.	Part No.	Description	Remark
Q104	8-729-905-35	TRANSISTOR 2SC4081-R	
Q110	8-729-920-XX	TRANSISTOR DTA114EUT106	
Q111	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q114	8-729-905-35	TRANSISTOR 2SC4081-R	
Q115	8-729-905-12	TRANSISTOR DTA144EU	
Q118	8-729-920-48	TRANSISTOR IMH2	
Q119	8-729-905-23	TRANSISTOR 2SA1576-R	
Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q122	8-729-905-35	TRANSISTOR 2SC4081-R	
Q202	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-905-35	TRANSISTOR 2SC4081-R	
Q213	8-729-905-18	TRANSISTOR DTC144EU	
Q214	8-729-106-60	TRANSISTOR 2SB1115A-YQ	
Q215	8-729-905-35	TRANSISTOR 2SC4081-R	
Q216	8-729-905-35	TRANSISTOR 2SC4081-R	
Q217	8-729-905-12	TRANSISTOR DTA144EU	
Q218	8-729-402-81	TRANSISTOR XN4501	
Q220	8-729-905-35	TRANSISTOR 2SC4081-R	
Q222	8-729-402-81	TRANSISTOR XN4501	
Q223	8-729-905-12	TRANSISTOR DTA144EU	
Q224	8-729-905-18	TRANSISTOR DTC144EU	
Q225	8-729-905-18	TRANSISTOR DTC144EU	
Q226	8-729-823-16	TRANSISTOR 2SC4555-5. 6. 7	
Q227	8-729-920-48	TRANSISTOR IMH2	
Q228	8-729-905-35	TRANSISTOR 2SC4081-R	
Q229	8-729-905-35	TRANSISTOR 2SC4081-R	
Q230	8-729-905-23	TRANSISTOR 2SA1576-R	
Q232	8-729-905-23	TRANSISTOR 2SA1576-R	
Q233	8-729-925-42	TRANSISTOR IMT2	
Q235	8-729-905-23	TRANSISTOR 2SA1576-R	
Q302	8-729-402-81	TRANSISTOR XN4501	
Q304	8-729-905-12	TRANSISTOR DTA144EU	
Q306	8-729-905-35	TRANSISTOR 2SC4081-R	
Q307	8-729-905-35	TRANSISTOR 2SC4081-R	
Q308	8-729-905-23	TRANSISTOR 2SA1576-R	
Q309	8-729-905-35	TRANSISTOR 2SC4081-R	
Q310	8-729-905-18	TRANSISTOR DTC144EU	
Q311	8-729-905-23	TRANSISTOR 2SA1576-R	
Q312	8-729-420-20	TRANSISTOR XN4312	
Q313	8-729-905-12	TRANSISTOR DTA144EU	
Q314	8-729-905-35	TRANSISTOR 2SC4081-R	
Q318	8-729-905-18	TRANSISTOR DTC144EU	

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Ref. No.	Part No.	Description				Remark
Q319	8-729-905-18	TRANSISTOR	DTC144EU			
Q401	8-729-921-08	TRANSISTOR	DTC144TU			
Q402	8-729-905-18	TRANSISTOR	DTC144EU			
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ			
Q991	8-729-905-35	TRANSISTOR	2SC4081-R			
		〈 RESISTOR 〉				
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R053	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R054	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R055	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R056	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R059	1-216-864-11	METAL CHIP	0	5%	1/16W	
R060	1-216-864-11	METAL CHIP	0	5%	1/16W	
R061	1-216-864-11	METAL CHIP	0	5%	1/16W	
R062	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R063	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R064	1-216-817-11	METAL CHIP	470	5%	1/16W	
R065	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R068	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R072	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R073	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R074	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R075	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R079	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R081	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R082	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R086	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R088	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R089	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R090	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R091	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R092	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R093	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R099	1-216-296-00	METAL CHIP	0	5%	1/8W	
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R107	1-216-811-11	METAL CHIP	150	5%	1/16W	
R108	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R109	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R110	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R111	1-216-812-11	METAL CHIP	180	5%	1/16W	
R114	1-216-818-11	METAL CHIP	560	5%	1/16W	
R125	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R126	1-216-820-11	METAL CHIP	820	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-817-11	METAL CHIP	470	5%	1/16W	
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	
R133	1-216-864-11	METAL CHIP	0	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R143	1-216-864-11	METAL CHIP	0	5%	1/16W	
R144	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R146	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	
R149	1-216-809-11	METAL CHIP	100	5%	1/16W	
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R204	1-216-864-11	METAL CHIP	0	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	
R216	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R232	1-216-653-11	METAL CHIP	1.2K	0.5%	1/10W	
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R239	1-216-643-11	METAL CHIP	470	0.5%	1/10W	
R240	1-216-864-11	METAL CHIP	0	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R249	1-216-813-11	METAL CHIP	220	5%	1/16W	
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R252	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R253	1-216-818-11	METAL CHIP	560	5%	1/16W	
R254	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R255	1-216-864-11	METAL CHIP	0	5%	1/16W	
R256	1-216-810-11	METAL CHIP	120	5%	1/16W	
R257	1-216-813-11	METAL CHIP	220	5%	1/16W	
R259	1-216-864-11	METAL CHIP	0	5%	1/16W	
R260	1-216-815-11	METAL CHIP	330	5%	1/16W	
R261	1-216-813-11	METAL CHIP	220	5%	1/16W	
R262	1-216-815-11	METAL CHIP	330	5%	1/16W	
R263	1-216-820-11	METAL CHIP	820	5%	1/16W	
R264	1-216-807-11	METAL CHIP	68	5%	1/16W	
R265	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R267	1-216-817-11	METAL CHIP	470	5%	1/16W	
R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R269	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R270	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R276	1-216-817-11	METAL CHIP	470	5%	1/16W	
R277	1-216-817-11	METAL CHIP	470	5%	1/16W	
R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R281	1-216-817-11	METAL CHIP	470	5%	1/16W	
R282	1-216-817-11	METAL CHIP	470	5%	1/16W	
R283	1-216-817-11	METAL CHIP	470	5%	1/16W	
R284	1-216-817-11	METAL CHIP	470	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R286	1-216-811-11	METAL CHIP	150	5%	1/16W	
R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R293	1-216-864-11	METAL CHIP	0	5%	1/16W	
R295	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R298	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R299	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R300	1-216-296-00	METAL CHIP	0	5%	1/8W	
R301	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R305	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R306	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R307	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R308	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R309	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R311	1-216-817-11	METAL CHIP	470	5%	1/16W	
R312	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R320	1-216-817-11	METAL CHIP	470	5%	1/16W	
R321	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R327	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R328	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R330	1-216-818-11	METAL CHIP	560	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	
R333	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R335	1-216-864-11	METAL CHIP	0	5%	1/16W	
R336	1-216-864-11	METAL CHIP	0	5%	1/16W	
R339	1-216-864-11	METAL CHIP	0	5%	1/16W	
R340	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R341	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R342	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R343	1-216-864-11	METAL CHIP	0	5%	1/16W	
R344	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R345	1-216-819-11	METAL CHIP	680	5%	1/16W	
R347	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R348	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R402	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R403	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R404	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R406	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R410	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R412	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R413	1-216-817-11	METAL CHIP	470	5%	1/16W	
R414	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R415	1-216-864-11	METAL CHIP	0	5%	1/16W	
R416	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R417	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R418	1-216-864-11	METAL CHIP	0	5%	1/16W	
R419	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R421	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R424	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R458	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R470	1-216-808-11	METAL CHIP	82	5%	1/16W	
R471	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R472	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R473	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R476	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R478	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R480	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R481	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R950	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R953	1-216-813-11	METAL CHIP	220	5%	1/16W	
R954	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R955	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R957	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R958	1-216-815-11	METAL CHIP	330	5%	1/16W	
R960	1-216-817-11	METAL CHIP	470	5%	1/16W	
R961	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R962	1-216-815-11	METAL CHIP	330	5%	1/16W	
R963	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R964	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R965	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R990	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R991	1-216-138-00	METAL CHIP	3.3	5%	1/8W	
R995	1-216-820-11	METAL CHIP	820	5%	1/16W	
R996	1-216-836-11	METAL CHIP	18K	5%	1/16W	

(RESISTOR BLOCK)

RB101	1-236-428-11	NETWORK, RES 22K
RB201	1-236-424-11	NETWORK, RES 10K
RB301	1-236-414-11	NETWORK, RES 1.5K

(VARIABLE RESISTOR)

RV051	1-238-087-11	RES, ADJ, CERMET	1K

(CRYSTAL)

X301	1-579-240-11	VIBRATOR, CRYSTAL (3.58MHz)

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A-7063-019-A VF-44 BOARD, COMPLETE

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(Ref.NO.2000 Series)

(CAPACITOR)

C501	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C502	1-126-176-11	ELECT	220uF	20%	10V
C503	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C504	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
⚠C505	1-163-053-00	CERAMIC CHIP	0.0033uF	10%	50V
⚠C506	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C508	1-127-515-11	ELECT(SOLID)	47uF	20%	6.3V
C509	1-126-090-11	ELECT	82uF	20%	10V

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Replace only with part number specified.

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Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10%	500V
C511	1-124-257-00	ELECT 2.2uF 20%	50V
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C513	1-137-306-11	FILM CHIP 0.1uF 5%	16V
C514	1-162-638-11	CERAMIC CHIP 1uF	16V
C515	1-131-381-00	TANTALUM 47uF 10%	10V
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10%	25V
C517	1-135-091-00	TANTALUM CHIP 1uF 20%	16V
		(CONNECTOR)	
* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
		(DIODE)	
⚠D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	
		(IC)	
IC501	8-759-420-01	IC AN2512S	
		(COIL)	
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-460-220-11	COIL, FERRITE (HLC)	
		(TRANSISTOR)	
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q502	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		(RESISTOR)	
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R506	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R507	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R519	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	
		(VARIABLE RESISTOR)	
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE	
RV503	1-238-096-11	RES, ADJ CERMET 1M	
RV503	1-238-862-11	RES, ADJ, CERMET 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV504	1-238-858-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	
		(SWITCH)	
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (+))	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (-))	
		(FLYBACK TRANS)	
T501	1-439-525-11	TRANSFORMER, FLYBACK	
		(THERMISTOR)	
TH501	1-809-350-21	THERMISTOR, NTC (2125)	

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Replace only with part number specified.

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Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		(SOCKET)	
W502	1-526-978-51	SOCKET ASSY, CRT	

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Ref. No.	Part No.	Description	Remark
	A-7071-542-A	VK-22 BOARD, COMPLETE ********************* (Ref. NO. 5000 Series)	
		(CONNECTOR)	
CN571	1-691-487-21	CONNECTOR, FFC/FPC 8P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	
		(DIODE)	
D570	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PB)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S575	1-572-498-11	SWITCH, SLIDE (REC)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	
		(FLEXIBLE BOARD)	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FFC-32)	

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MISCELLANEOUS
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Ref. No.	Part No.	Description	Remark
105	1-692-025-11	SWITCH, PUSH	
11	1-550-743-11	HOLDER, BATTERY	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
134	1-547-445-11	FILTER BLOCK, OPTICAL	
136	1-547-540-11	LENS, ZOOM ASSY (VCL-6110WA)	
25	1-542-126-41	MICROPHONE UNIT	
30	1-241-771-11	RES, VAR (FOCUS RING)	
315	1-572-987-11	SWITCH, PUSH (3 KEY)	
322	1-691-254-12	CONNECTOR, TRANSLATION 10P	
36	1-690-604-11	CABLE, FLAT (FFC-33)	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
IC901	8-752-606-79	IC ICX044BKA-2 (CCD IMAGER)	
M901	A-7048-564-A	DRUM ASSY (DGH-78A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

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ACCESSORIES & PACKING MATERIALS
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Ref. No.	Part No.	Description	Remark
*	1-571-163-31	SWITCH, ANTENNA CHANGE (CABLE) (FX400)	
	1-693-017-11	REMOTE COMMANDER (RMT-509)	
	3-701-625-00	BAG, POLYETHYLENE	
	3-738-517-01	BELT(S), SHOULDER (FX411/FX400)	
*	3-754-318-01	INSTRUCTION (FX400)	
	3-754-385-21	MANUAL, INSTRUCTION (ENGLISH) (FX410)	
	3-754-385-31	MANUAL, INSTRUCTION (FRENCH) (FX410:Canadian)	
	3-755-131-21	MANUAL, INSTRUCTION (ENGLISH) (FX411)	
	3-755-132-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (FX400)	
	3-755-132-41	MANUAL, INSTRUCTION (CHINESE) (FX400)	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT (FX410:US/FX411)	
	3-941-737-01	BELT, SHOULDER (FX410)	
*	3-947-110-01	INDIVIDUAL CARTON (FX410)	
*	3-947-110-31	INDIVIDUAL CARTON (FX411)	
*	3-947-110-41	INDIVIDUAL CARTON (FX400)	
*	3-947-111-02	CUSHION, ACC	
*	3-947-112-02	CUSHION (LOWER)	
	3-947-500-01	LID, BATTERY CASE	
	9-910-999-32	BAG, PROTECTION	
	A-6767-816-A	RFU ADAPTER (RFU-89NA) (FX400)	
	A-6768-253-A	RFU ADAPTER (RFU-90UC) (FX410/FX411)	
**	AC-V60A	AC POWER ADAPTOR	
***	NP-55H	BATTREY PACK	

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Replace only with part number specified.

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Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

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HARDWARE LIST
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Ref. No.	Part No.	Description	Remark
#1	7-621-283-10	SCREW +P 2X10	

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 220.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-31 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (20P, 0.8 mm)	J-6082-169-A	For extension of VA-71 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-61 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-45, VK-22 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

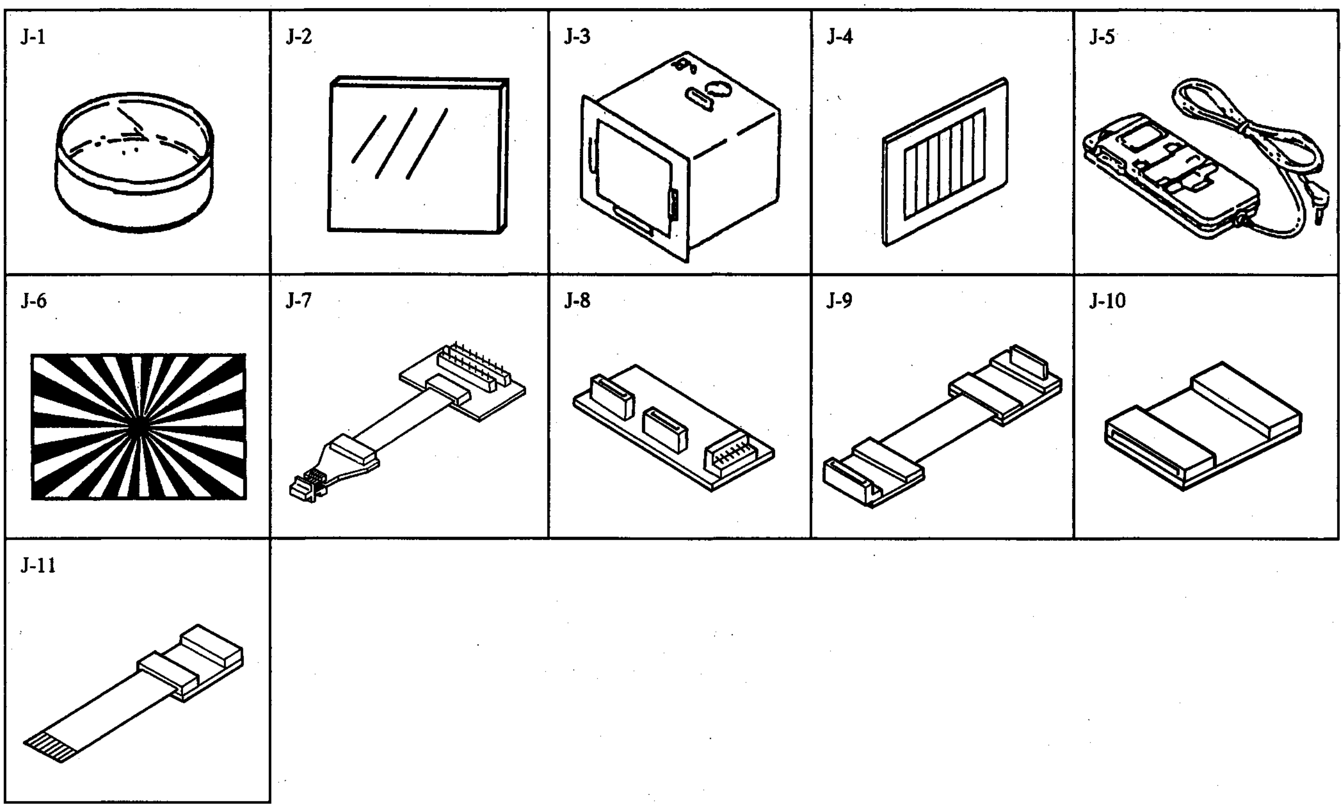
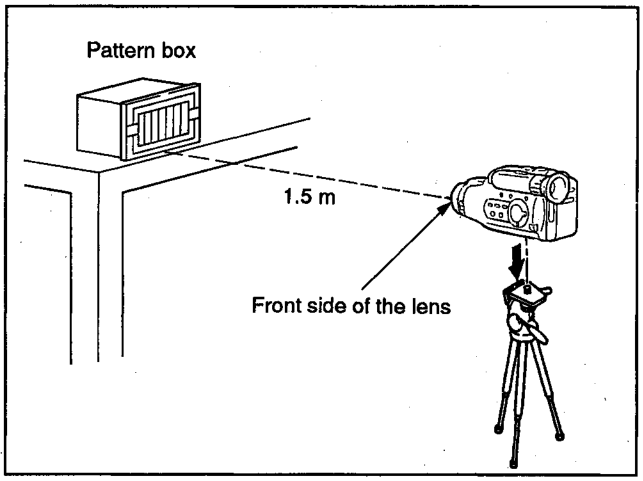

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

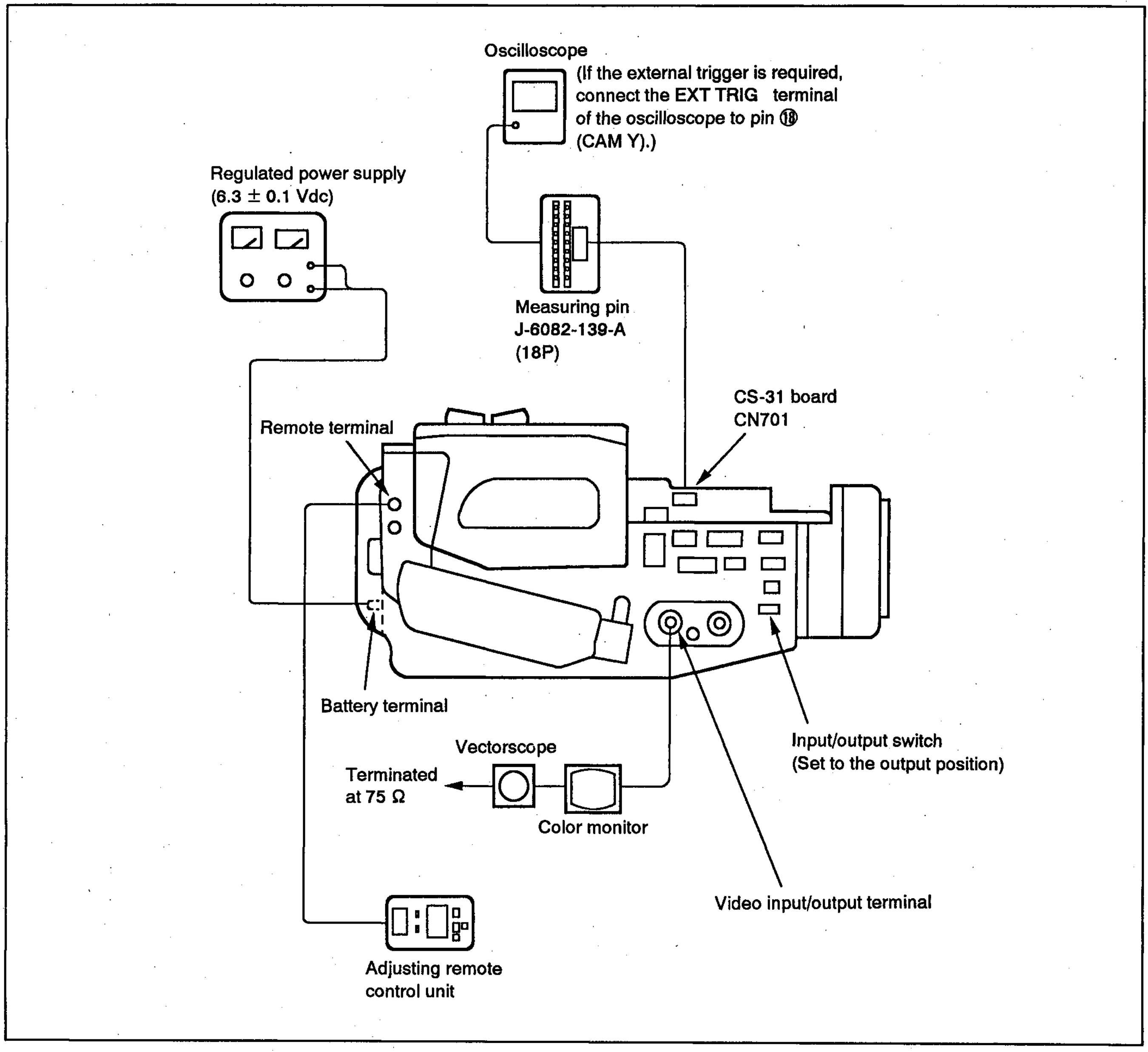
Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.



Pattern box
1.5 m
Front side of the lens

Fig. 7-2.



Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
Regulated power supply (6.3 ± 0.1 Vdc)
Measuring pin J-6082-139-A (18P)
CS-31 board CN701
Remote terminal
Battery terminal
Vectorscope
Terminated at 75 Ω
Color monitor
Input/output switch (Set to the output position)
Video input/output terminal
Adjusting remote control unit

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-30 board S540)·····Camera
2. Standby switch (SW-200 board S581)·················Standby
3. AE dial (CK-47 board S560)······························· OFF
4. Input/output switchover switch (PJ-45 board S551) ···Output
5. Back light button (CK-47 board S567)·······················Off

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

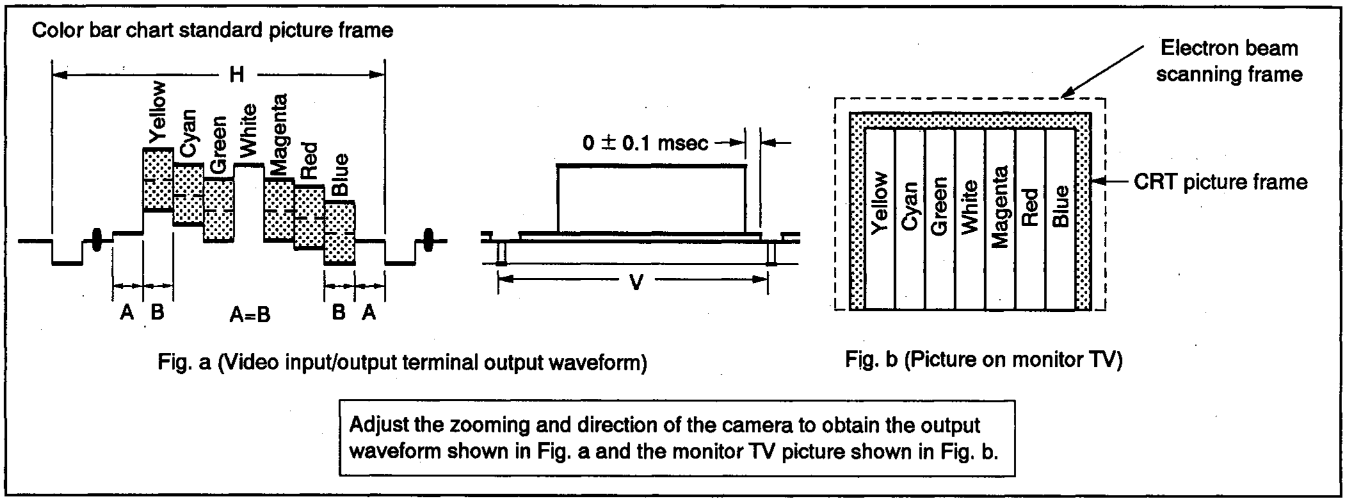

Color bar chart standard picture frame
H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

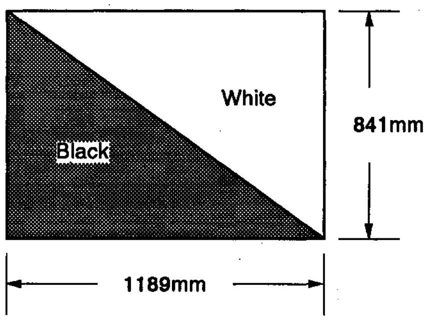

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-31 board IC702). These processes are carried out by the camera micro processor (CS-31 board IC709). This micro processor reads the data written in the non-volatile memory (CS-31 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

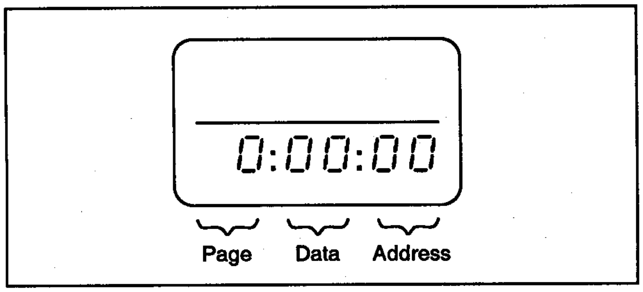


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▸▸) button is pressed, and decrease when the REW (◂◂) button is pressed. There are altogether 256 addresses, from 00 to FF. However, the addresses which are not used for the adjustments will not be displayed.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2" colspan="2">Function
[ ] indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>00</td><td>ID</td><td colspan="2">Set ID</td><td>00</td><td>2A</td></tr>
<tr><td>01</td><td>FADER LEVEL</td><td colspan="2">AE REF level modification during fader</td><td>E0</td><td>E0</td></tr>
<tr><td>02</td><td>FADER ENDTIM</td><td colspan="2">The setting of the AE REF modulation time during fader</td><td>10</td><td>10</td></tr>
<tr><td>03</td><td>CS SL</td><td colspan="2">Carrier balance adjustment</td><td>35</td><td></td></tr>
<tr><td>04</td><td>VSUB</td><td colspan="2">CCD imager V SUB adjustment [IC702 ③]</td><td>80</td><td></td></tr>
<tr><td>05</td><td>VPGH</td><td colspan="2">CCD imager VRG adjustment [IC702 ④]</td><td>80</td><td></td></tr>
<tr><td>06</td><td>VREF Y</td><td colspan="2">Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]</td><td>7B</td><td></td></tr>
<tr><td>07</td><td>VREF C</td><td colspan="2">Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]</td><td>99</td><td></td></tr>
<tr><td>08</td><td>HALL GAIN</td><td>Hole amplifier gain adjustment [IC702 ⑦]</td><td rowspan="2">HALL adjustment</td><td>47</td><td></td></tr>
<tr><td>09</td><td>HALL OFFSET</td><td>Hole amplifier offset adjustment [IC702 ⑧]</td><td>71</td><td></td></tr>
<tr><td>0A</td><td>E LOWLIGHT START</td><td colspan="2">Low luminance intensity REF level modulation start setting</td><td>30</td><td>30</td></tr>
<tr><td>0B</td><td>REF 2V</td><td colspan="2">2V standard voltage for hole element [IC702 ⑫]</td><td>68</td><td>68</td></tr>
<tr><td>0C</td><td>AD REF</td><td colspan="2">Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]</td><td>72</td><td></td></tr>
<tr><td>0D</td><td>CORE DETH</td><td colspan="2">CCD correction control</td><td>04</td><td>04</td></tr>
<tr><td>0E</td><td>CORE VTR DELAY</td><td colspan="2">1HDL longitudinal setting during VTR playback</td><td>16</td><td>16</td></tr>
<tr><td>0F</td><td>CORE APCN4</td><td colspan="2">Horizontal aperture setting</td><td>A5</td><td>A5</td></tr>
<tr><td>10</td><td>CORE APCN5</td><td colspan="2">Vertical aperture setting</td><td>3D</td><td>3D</td></tr>
<tr><td>11</td><td>CORE EFECT</td><td colspan="2">Special effect control</td><td>A8</td><td>A8</td></tr>
<tr><td>12</td><td>CORE MATR</td><td colspan="2">BLUE matrix constant</td><td>27</td><td>27</td></tr>
<tr><td>13</td><td>CORE MATB</td><td colspan="2">RED matrix constant</td><td>6C</td><td>6C</td></tr>
<tr><td>14</td><td>CORE BURST LEVEL</td><td colspan="2">Burst flag level setting, color modulation ON/OFF<table><tr><th>Data</th><th>Adjustment modeAdjustment</th></tr><tr><td>2C</td><td>Normal level</td></tr><tr><td>2E</td><td>Color modulation stopped</td></tr></table></td><td>2C</td><td>2C</td></tr>
<tr><td>15</td><td>CORE CHROMA DLY</td><td colspan="2">Y/C delay adjustment</td><td>07</td><td>08</td></tr>
<tr><td>16</td><td>CORE Y SETUP</td><td colspan="2">Set up level setting</td><td>06</td><td>06</td></tr>
<tr><td>17</td><td>CORE VHAPCN</td><td colspan="2">Slice and level setting of the aperture signal</td><td>17</td><td>17</td></tr>
<tr><td>18</td><td>CORE B-Y GAIN</td><td>B–Y GAIN</td><td rowspan="4">Color reproduction adjustments</td><td>13</td><td></td></tr>
<tr><td>19</td><td>CORE R-Y GAIN</td><td>R–Y GAIN</td><td>11</td><td></td></tr>
<tr><td>1A</td><td>CORE R-Y HUE</td><td>R–Y HUE</td><td>FF</td><td></td></tr>
<tr><td>1B</td><td>CORE B-Y HUE</td><td>B–Y HUE</td><td>FD</td><td></td></tr>
<tr><td>1C</td><td>CS/APCCUT</td><td colspan="2">Low luminance intensity aperture and chroma suppress level</td><td>22</td><td>22</td></tr>
</table>

Table 7-2 (1).

Address	**Name**	**Function** **[ ] indicate the adjustment voltage output terminal**		**Adjustment data**	
				Initial value	**Memo column**
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>4A</td><td>AWB BOTTOM DWN</td><td>AWB incoming frame bottom lower value</td><td>94</td><td>94</td></tr>
<tr><td>4B</td><td>AWB MIDDLE UP</td><td>AWB incoming frame middle upper value</td><td>AD</td><td>AD</td></tr>
<tr><td>4C</td><td>AWB MIDDLE DWN</td><td>AWB incoming frame middle lower value</td><td>96</td><td>96</td></tr>
<tr><td>4D</td><td>AWB TOP UP</td><td>AWB incoming frame top upper value</td><td>78</td><td>78</td></tr>
<tr><td>4E</td><td>AWB TOP DWN</td><td>AWB incoming frame top lower value</td><td>60</td><td>60</td></tr>
<tr><td>4F</td><td>AWB KEIKO</td><td>AWB incoming frame fluorescent light output lower value</td><td>6C</td><td>6C</td></tr>
<tr><td>50</td><td>AWB KEIKO DWN</td><td>AWB incoming frame fluorescent light lower value</td><td>5C</td><td>5C</td></tr>
<tr><td>51</td><td>AWB R TOP LMT</td><td>AWB incoming frame Rcont upper value</td><td>6E</td><td>6E</td></tr>
<tr><td>52</td><td>AWB R DWN LMT</td><td>AWB incoming frame Rcont lower value</td><td>20</td><td>20</td></tr>
<tr><td>53</td><td>AWB B TOP LMT</td><td>AWB incoming frame Bcont upper value</td><td>83</td><td>83</td></tr>
<tr><td>54</td><td>AWB B IN TOP</td><td>AWB incoming frame Bcont</td><td>67</td><td>67</td></tr>
<tr><td>55</td><td>AWB B IN MAX</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>56</td><td>AWB B OUT MIN</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>57</td><td>AWB B OUT DWN</td><td>AWB incoming frame Bcont</td><td>4A</td><td>4A</td></tr>
<tr><td>58</td><td>AWB B DWN LMT</td><td>AWB incoming frame Bcont lower value</td><td>1B</td><td>1B</td></tr>
<tr><td>59</td><td>AWB LL LMT</td><td>Low luminance intensity limiter</td><td>06</td><td>06</td></tr>
<tr><td>5A</td><td>AWB T M DIVID</td><td>AWB incoming frame upper, middle border value</td><td>5B</td><td>5B</td></tr>
<tr><td>5B</td><td>AWB B M DIVID</td><td>AWB incoming frame middle, lower border value</td><td>39</td><td>39</td></tr>
<tr><td>5C</td><td>AWB DELAY TM</td><td>AWB tracking speed
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>01</td><td>High speed tracking mode</td></tr>
<tr><td>10</td><td>Normal</td></tr>
</table></td><td>10</td><td>10</td></tr>
<tr><td>5D</td><td>AWB FAST TM</td><td>AWB initial high speed tracking amount</td><td>40</td><td>40</td></tr>
<tr><td>5E</td><td>AWB OUT HYS OFF</td><td>AWB outdoor hysteresis off difference</td><td>0C</td><td>0C</td></tr>
<tr><td>5F</td><td>AWB OUT B HYS</td><td>AWB outdoor hysteresis amount</td><td>06</td><td>06</td></tr>
<tr><td>60</td><td>AWB MODE</td><td>AWB adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Normal</td></tr>
<tr><td>D0</td><td>AWB adjustment mode</td></tr>
<tr><td>F1</td><td>Sampling display mode</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>61</td><td>AE REFL</td><td>Reference value (lower) for AE</td><td>00</td><td>00</td></tr>
<tr><td>62</td><td>AE REFH</td><td>Reference value (upper) for AE</td><td>18</td><td>18</td></tr>
<tr><td>63</td><td>AGC MIN</td><td>AGC MIN value (AGCREF value), IRIS level adjustment</td><td>E3</td><td></td></tr>
<tr><td>64</td><td>AE MIML</td><td>Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment</td><td>32</td><td></td></tr>
<tr><td>65</td><td>AE MAXL</td><td>High luminance intensity side limiter (lower)</td><td>80</td><td>80</td></tr>
<tr><td>66</td><td>IRIS OFFSET</td><td>Iris ROM table OPEN side off set</td><td>D0</td><td>D0</td></tr>
<tr><td>67</td><td>AE KEISU</td><td>Correction coefficient during detection weighting</td><td>00</td><td>00</td></tr>
<tr><td>68</td><td>AE FUNCTION</td><td>SW for turning each AE function ON and OFF</td><td>00</td><td>00</td></tr>
<tr><td>69</td><td>BL HOSEIH</td><td>Forcible back light level setting (upper)</td><td>40</td><td>40</td></tr>
<tr><td>6A</td><td>JITEISU DOWN</td><td>Constant during loop response DOWN side</td><td>30</td><td>30</td></tr>
<tr><td>6B</td><td>JITEISU UP</td><td>Constant during loop response UP side</td><td>10</td><td>10</td></tr>
<tr><td>6C</td><td>AE KNEE</td><td>KNEE setting value for AE</td><td>FF</td><td>FF</td></tr>
<tr><td>6D</td><td>ORETEN SET</td><td>Variable point due to time constant error amount</td><td>13</td><td>13</td></tr>
</table>

Table 7-2 (3).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2" colspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>6E</td><td>OMOMIOUT</td><td colspan="2">Outer frame weighting amount</td><td>40</td><td>40</td></tr>
<tr><td>6F</td><td>AFC WIDE</td><td colspan="2">Coefficient required for the ANF integral loop</td><td>03</td><td>03</td></tr>
<tr><td>70</td><td>AFC GAIN</td><td colspan="2">Loop gain of the flickerless loop</td><td>01</td><td>01</td></tr>
<tr><td>71</td><td>AFC LIMIL</td><td colspan="2">Limiter corresponding to the error rate (Lower)</td><td>60</td><td>60</td></tr>
<tr><td>72</td><td>HIST P KEISU</td><td colspan="2">Histocomp level setting P for counter light determination</td><td>20</td><td>20</td></tr>
<tr><td>73</td><td>HIST H KEISU</td><td colspan="2">Histocomp level setting H for counter light determination</td><td>E0</td><td>E0</td></tr>
<tr><td>74</td><td>HIST L KEISU</td><td colspan="2">Histocomp level setting L for counter light determination</td><td>90</td><td>90</td></tr>
<tr><td>75</td><td>GYKOU JITEISU</td><td colspan="2">Constant during auto back light response</td><td>08</td><td>08</td></tr>
<tr><td>76</td><td>SUBN LIMIT</td><td colspan="2">Limiter for counter light determination</td><td>40</td><td>40</td></tr>
<tr><td>77</td><td>FUZZY RULE1</td><td colspan="2">Correction amount 1 for auto back light</td><td>90</td><td>90</td></tr>
<tr><td>78</td><td>FUZZY RULE2</td><td colspan="2">Correction amount 2 for auto back light</td><td>C0</td><td>C0</td></tr>
<tr><td>79</td><td>FUZZY RULE3</td><td colspan="2">Correction amount 3 for auto back light</td><td>B0</td><td>B0</td></tr>
<tr><td>7A</td><td>FUZZY RULE4</td><td colspan="2">Correction amount 4 for auto back light</td><td>A0</td><td>A0</td></tr>
<tr><td>7B</td><td>FUZZY RULE5</td><td colspan="2">Correction amount 5 for auto back light</td><td>70</td><td>70</td></tr>
<tr><td>7C</td><td>FUZZY RULE6</td><td colspan="2">Correction amount 6 for auto back light</td><td>80</td><td>80</td></tr>
<tr><td>7D</td><td>FUZZY RULE7</td><td colspan="2">Correction amount 7 for auto back light</td><td>A0</td><td>A0</td></tr>
<tr><td>7E</td><td>FUZZY RULE8</td><td colspan="2">Correction amount 8 for auto back light</td><td>98</td><td>98</td></tr>
<tr><td>7F</td><td>FUZZY RULE9</td><td colspan="2">Correction amount 9 for auto back light</td><td>90</td><td>90</td></tr>
<tr><td>80</td><td>FUZZY RULE10</td><td colspan="2">Correction amount 10 for auto back light</td><td>78</td><td>78</td></tr>
<tr><td>81</td><td>IRIS MIN L</td><td colspan="2">Iris limit value for small iris (Lower)</td><td>80</td><td>80</td></tr>
<tr><td>82</td><td>IRIS MIN H</td><td colspan="2">Iris limit value for small iris (Upper)</td><td>02</td><td>02</td></tr>
<tr><td>83</td><td>DELTA SHUTGAIN</td><td colspan="2">Smoothing amount setting</td><td>04</td><td>04</td></tr>
<tr><td>84</td><td>AE WAKUH</td><td colspan="2">Frame data for AE detection (vertical line)</td><td>0F</td><td>0F</td></tr>
<tr><td>85</td><td>AE WAKUV</td><td colspan="2">Frame data for AE detection (horizontal line)</td><td>4F</td><td>4F</td></tr>
<tr><td>86</td><td>WIDE LIMIT</td><td>ZOOM limiter WIDE (lower)</td><td rowspan="5">Flange back adjustment</td><td>00</td><td></td></tr>
<tr><td>87</td><td>WIDE LIMITH</td><td>ZOOM limiter WIDE (upper)</td><td>00</td><td></td></tr>
<tr><td>88</td><td>TELE LIMIT</td><td>ZOOM limiter TELE (lower)</td><td>00</td><td></td></tr>
<tr><td>89</td><td>TELE SIMITH</td><td>ZOOM limiter TELE (upper)</td><td>04</td><td></td></tr>
<tr><td>8A</td><td>STEP ZERO</td><td>Flange back value</td><td>80</td><td></td></tr>
<tr><td>8B</td><td>STEP ZERO SPAN
(VAP ONLY)</td><td colspan="2">Flange back value 2</td><td>00</td><td>00</td></tr>
<tr><td>8C</td><td>ZOOM SPD FAST</td><td colspan="2">Zoom speed (fast)</td><td>18</td><td>18</td></tr>
<tr><td>8D</td><td>ZOOM SPD SUPER</td><td colspan="2">Zoom speed (For adjustment)</td><td>7D</td><td>7D</td></tr>
<tr><td>8E</td><td>ZS INIT SLOW</td><td colspan="2">Zoom speed initial value (slow)</td><td>AB</td><td>7D</td></tr>
<tr><td>8F</td><td>ZS INIT FAST</td><td colspan="2">Zoom speed initial value (fast)</td><td>C9</td><td>C9</td></tr>
<tr><td>90</td><td>ZMSPD DAMIN</td><td colspan="2">Zoom speed D/A MIN value</td><td>3D</td><td>3D</td></tr>
<tr><td>91</td><td>ZS K</td><td colspan="2">Zoom servo coefficient K</td><td>12</td><td>12</td></tr>
<tr><td>92</td><td>ZS L</td><td colspan="2">Zoom servo coefficient L</td><td>02</td><td>02</td></tr>
<tr><td>93</td><td>ZP HYS</td><td colspan="2">Zoom potential hysteresis</td><td>05</td><td>05</td></tr>
<tr><td>94</td><td>MOTOR ABILITY</td><td colspan="2">Step motor MAX SPEED</td><td>0B</td><td>07</td></tr>
<tr><td>95</td><td>AF MD2THL</td><td colspan="2">MODE2 THR</td><td>20</td><td>20</td></tr>
<tr><td>96</td><td>MAXCHG THR</td><td colspan="2">MAX value renewal THR</td><td>1A</td><td>1A</td></tr>
<tr><td>97</td><td>ERR THL</td><td colspan="2">Wobbling width THR</td><td>18</td><td>18</td></tr>
<tr><td>98</td><td>WOB INTV</td><td colspan="2">Wobbling second interval</td><td>04</td><td>04</td></tr>
<tr><td>99</td><td>ERRPOL THR</td><td colspan="2">MODE2 error possible THR</td><td>13</td><td>13</td></tr>
</table>

Table 7-2 (4).

Note 3: If the [ ] is camera micro processor version 1, refer to [Page F Data Modification] on page for how to distinguish the versions.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>C9</td><td>C9</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>D2</td><td>D2</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>03</td><td>03</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>10</td><td>10</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>10</td><td>10</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>80</td><td>80</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>[B8] D8</td><td>[B8] D8</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>22</td><td>22</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>03</td><td>R–Y, B–Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>b ratio display</td></tr>
<tr><td>91</td><td>R.B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>12</td><td></td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3F</td><td></td></tr>
<tr><td>B2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>ZOOM DROP 1</td><td>F-No. dropping (1) by zoom lens</td><td>00</td><td></td></tr>
<tr><td>B5</td><td>ZOOM DROP 2</td><td>F-No. dropping (2) by zoom lens</td><td>95</td><td></td></tr>
<tr><td>B6</td><td></td><td></td><td></td><td></td></tr>
</table>

Table 7-2 (5).

Address	**Name**	**Function** **[ ] Indicate the adjustment voltage output terminal**	**Adjustment data**	
			Initial value	**Memo column**
B7				
B8				
B9				
BA				
BB				
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	07	
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	7D	
C1	AF CONTROL FLAG		2C	
C2	AE Y THR	Low luminous intensity AE Y THR1	40	
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	
C4	MD2 SPD	Focus speed at MODE 2	41	
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	[20] 30	
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	01 02 04	Camera micro processor ver1 Camera micro processor ver2, ver3 Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-31 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

②

The upper digits of the hexadecimal notation The lower digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① **B (b)**	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-282 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
–9V check	
Measurement point	Pin ⑫ of CN950
Specified value	–9.0 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 1F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

In the case of camera micro processor Ver.2, Ver.3 and Ver.4, change the data listed below.

Address	Data
15 (CORE CHROMA DLY)	08
8D (ZOOM SPDSUPER)	7D
8E (ZS INIT SLOW)	7D
94 (ZOOM SPD SLOW)	07

In the case of camera micro processor Ver.1, change the data listed below.

Address	Data
15 (CORE CHROMA DLY)	08
8D (ZOOM SPDSUPER)	7D
8E (ZS INIT SLOW)	7D
94 (ZOOM SPD SLOW)	07
C5 (AE CHECK)	20

[Distinguishing the Camera Micro Computer (IC709) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.1	CXP80624-256Q	01
Ver.2	CXP80624-261Q	02
Ver.3	CXP80624-269Q	02
Ver.4	CXP80624-278Q	04

4. 28 MHz Original Oscillation Adjustment (CS-31 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14318181 ± 71 Hz

Adjusting method:

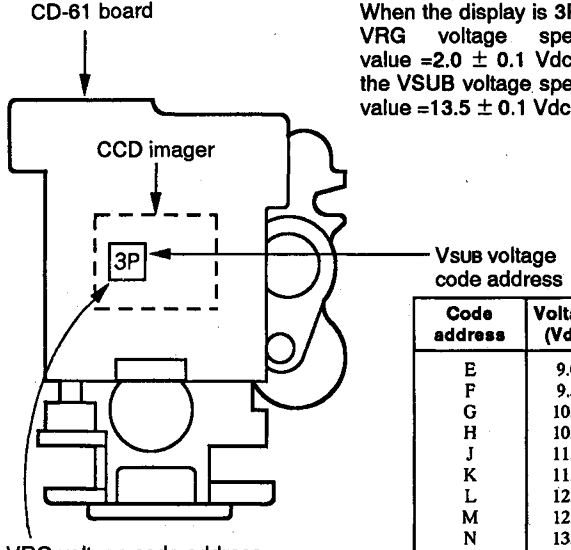
1) Use CT801 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-7.

6. VRG Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-282 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-282 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
   $A'=W_2'+K_1'-W_1'-K_2'$ ··························Equation 1
   $B'=W_1'-K_1'$ ··Equation 2
   $X_1'=\dfrac{2048+(48\times A')-(16\times B')}{A'}$ ················Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
   (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to hexadecimal notation, and obtain W_0.
21) Calculate X_2' using the following equations (decimal notation calculation).
   $C'=W_0'-B'-51$ ··································Equation 4
   $X_2'=\dfrac{(128-B')\times(X_1'-48)+48\times C'}{C'}$ ···········Equation 5
   (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
   (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1m from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	8A (STEP ZERO), 86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H)

Adjusting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
7) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2 = D_1 \pm 5$ $D_4 = D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: 6, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus.

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2 = D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

12) Shoot the Siemens star at the zoom TELE end.
13) Rotate the focus ring, and adjust the focus.
14) Adjust to the zoom WIDE edge.
15) Read the focus step value displayed on the TV monitor, and adjust to D_3.
16) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and adjust to D_4.
17) Check that $D_4 = D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=140 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

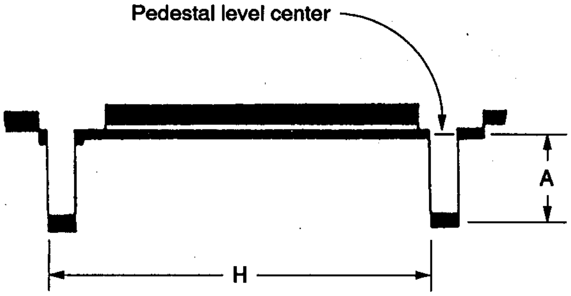


Fig. 7-8.

12. BURST Level Adjustment (CS-31 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=140 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

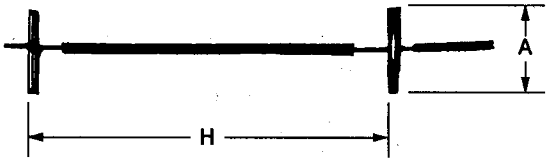


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 06 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

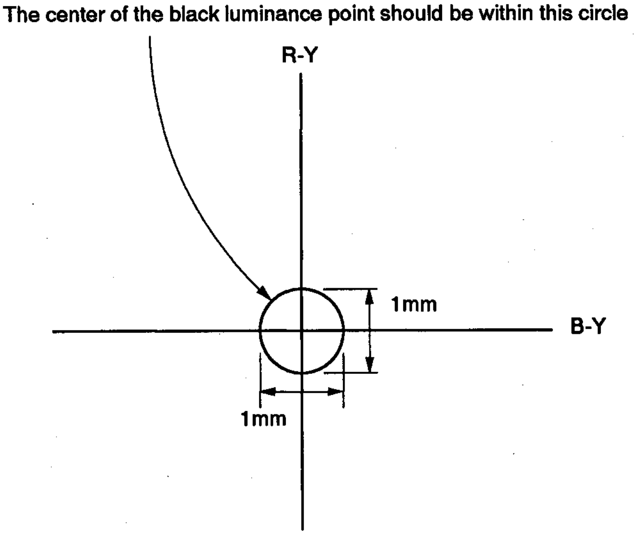

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

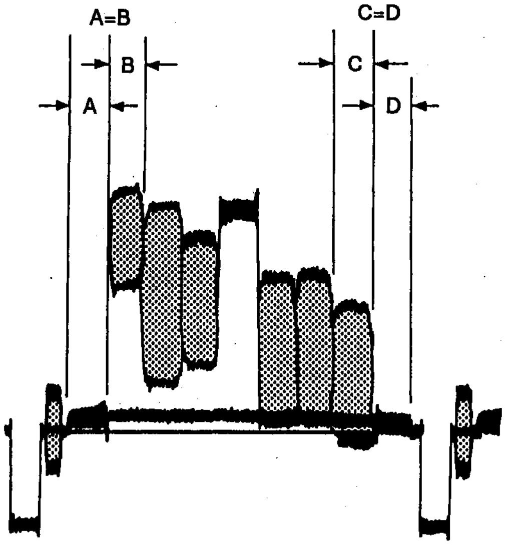
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus ring.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

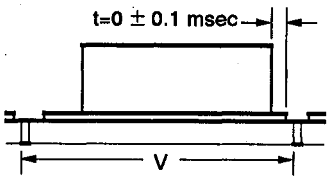


Fig. 7-11.

Check on the TV monitor

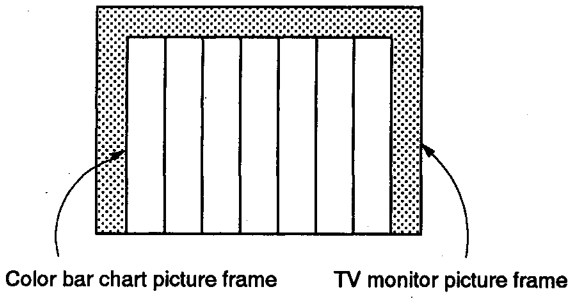


Fig. 7-12.

16. IRIS Level Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=150 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

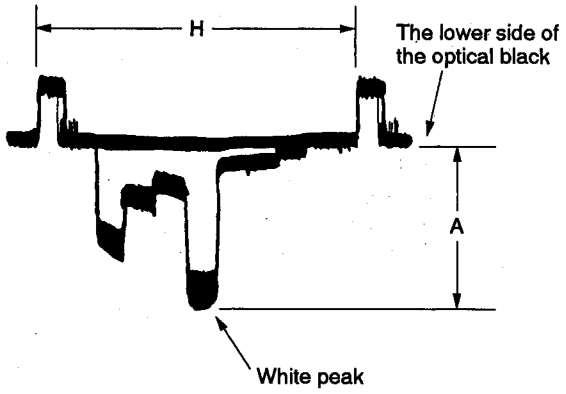


Fig. 7-13.

17. MAX GAIN Adjustment (CS-31 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=210 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

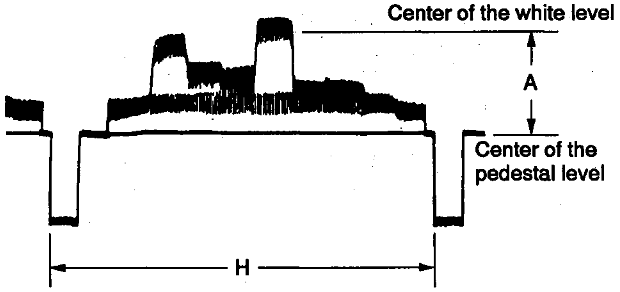


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point Measuring Instrument	DDS display of the EVF or TV monitor
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

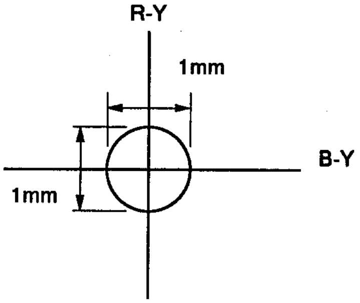


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
   (Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

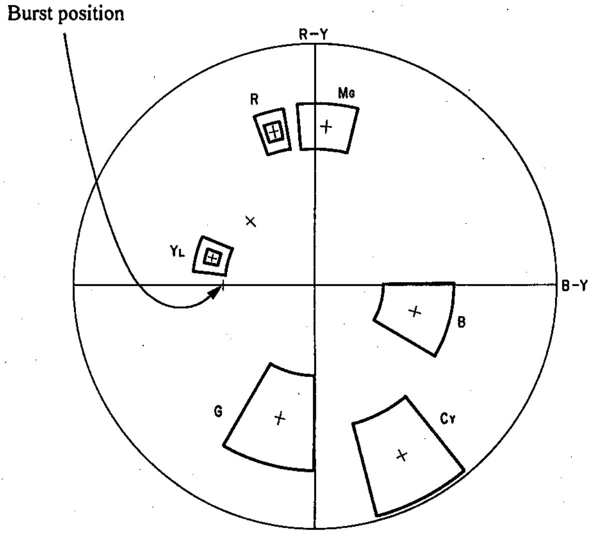


Fig. 7-16.

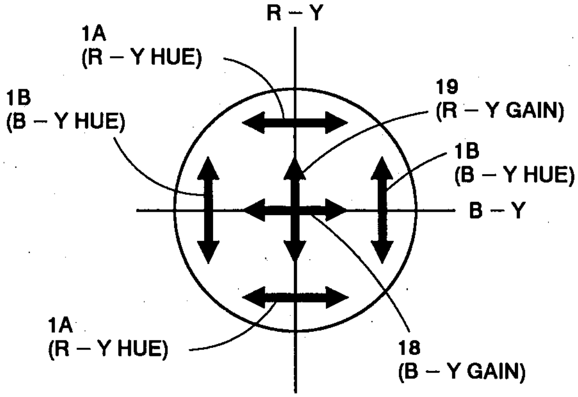


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio 5C80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
    (Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
    (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 10 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

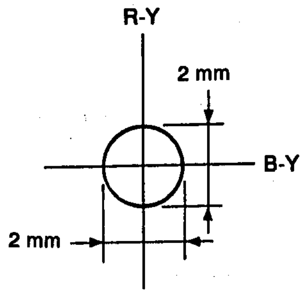


Fig. 7-18. A

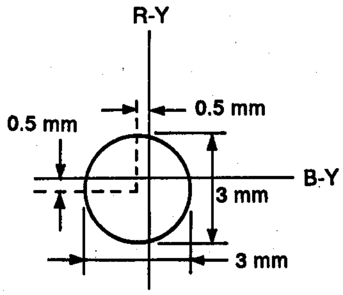


Fig. 7-18. B

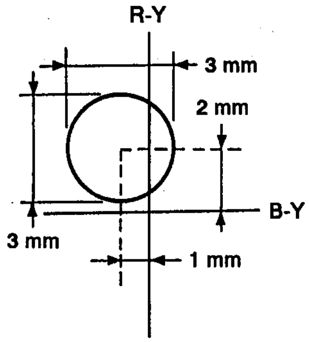


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note: Check that position that was set in the color bar chart picture frame "14. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 02 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y data display mode setting)
6) Read the average value of the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or monitor TV), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display data, and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: 8F to page: 1, address: E7.
11) Read the average value of the DDS display data, and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
    (D3D is hexadecimal notation)

X_1' value	D3D
$-1 \leqq X_1' \leqq 1$	F0
$X_1'>1$	F1
$X_1'<-1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
    1. Set data: D9 to page: 1, address: E6.
    2. Set data: F7 to page: 1, address: E7.
17) Read the average value of the DDS display data, and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	D3E
$X_2' \geqq 0$	00
$0>X_2' \geqq -1$	01
$-1>X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 2C to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y data display mode)
4) Turn the main power supply (6.3V) off.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=690 ± 40 mV SYNC level=285 ± 20 mV BURST level=280 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

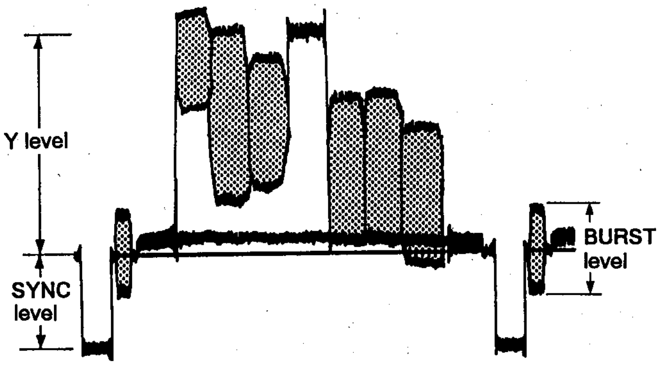


Fig. 7-19.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-21.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-20.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

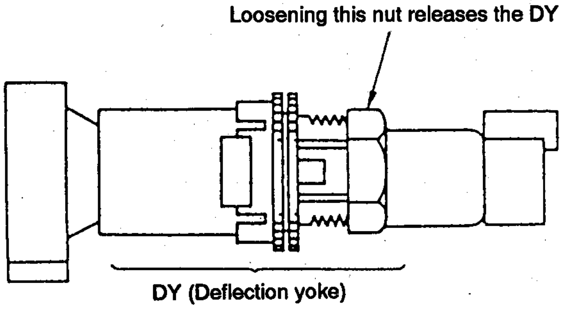
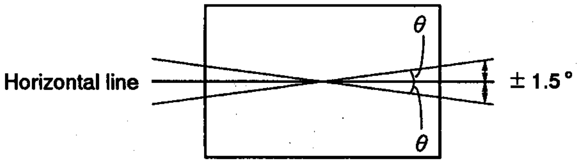


Fig. 7-20.



Specified value: Image orientation within ± 1.5 ° of horizontal line.

Fig. 7-21.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-23.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-22.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

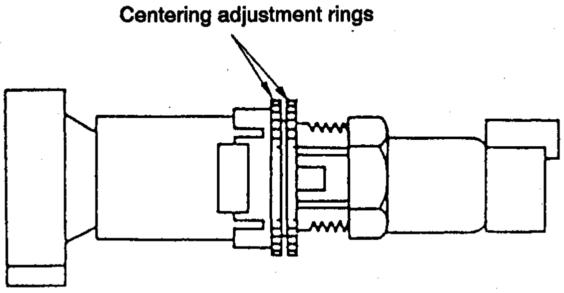


Fig. 7-22.

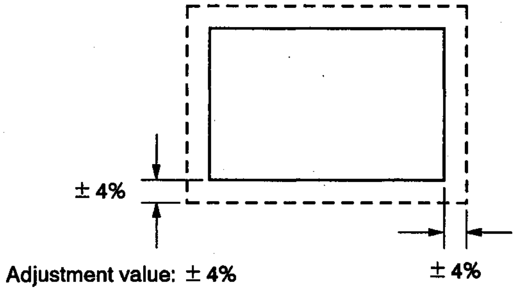


Fig. 7-23.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.60 ± 0.05 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern $\boxed{A}$ of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-25.)

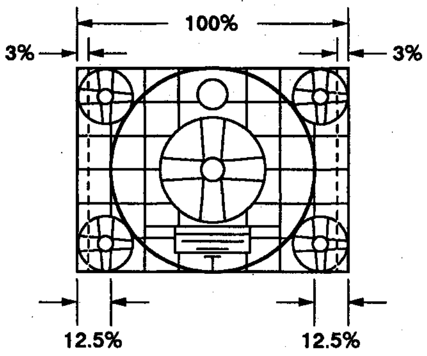
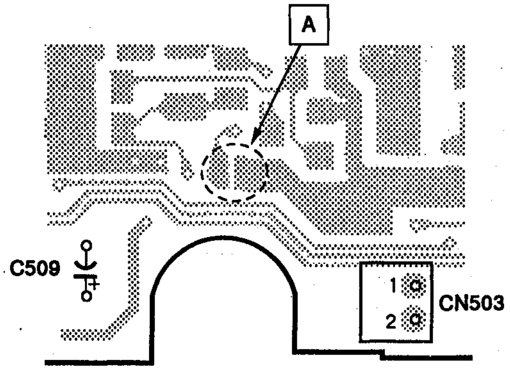


Fig. 7-24.



VF-44 BOARD (COMPONENT SIDE)

A section	H size
Short	Large
Open	Small

Fig. 7-25.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	5 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 5 ± 3% (upper and lower total).

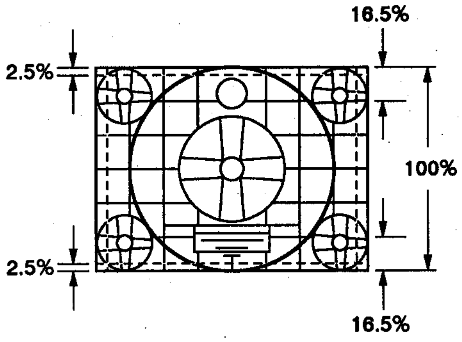


Fig. 7-26.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

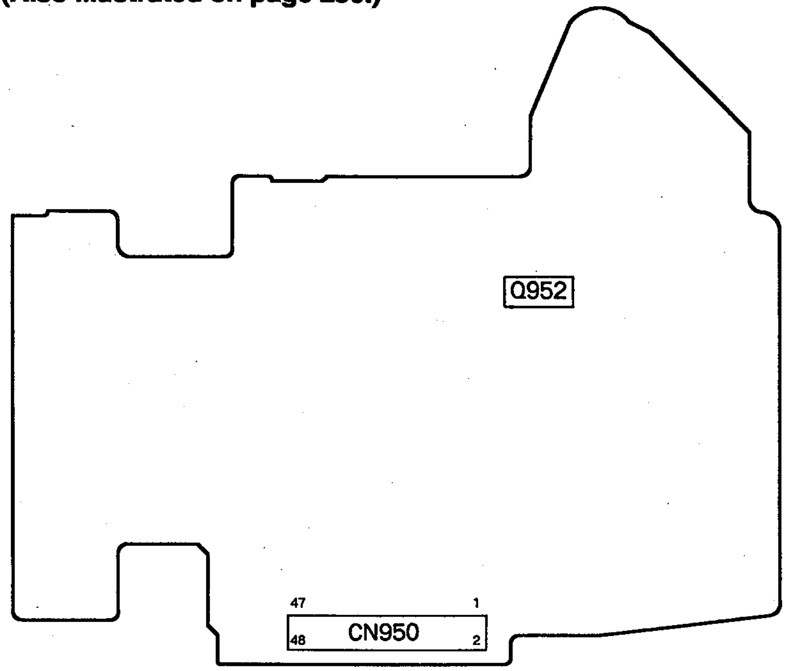
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

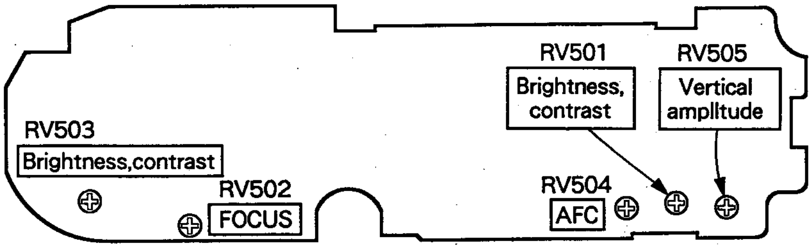
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

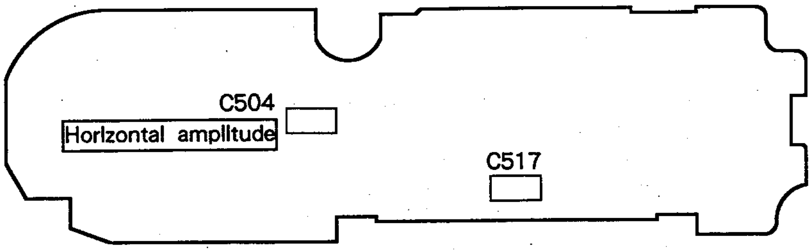
PS-282 BOARD (COMPONENT SIDE)
(Also illustrated on page 250.)


Q952
47
1
48
CN950
2

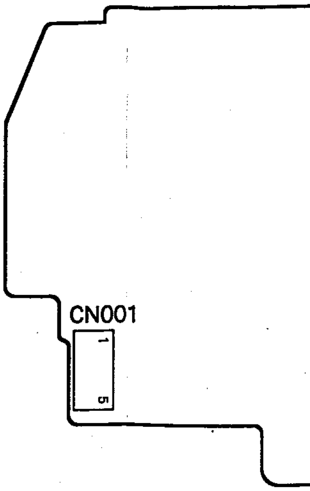
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

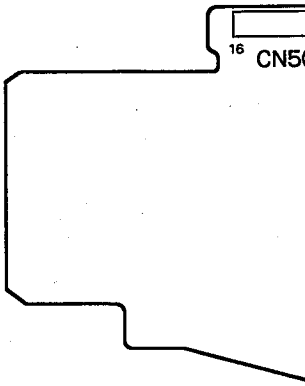
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

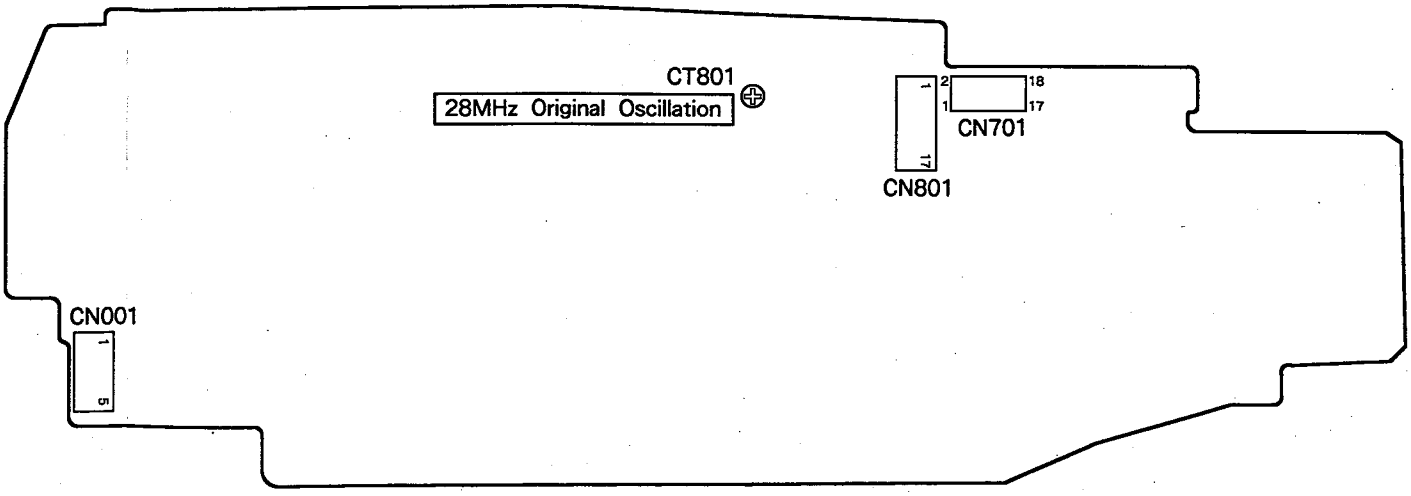
CS-31 BOARD (COMPON
(Also illustrated on page



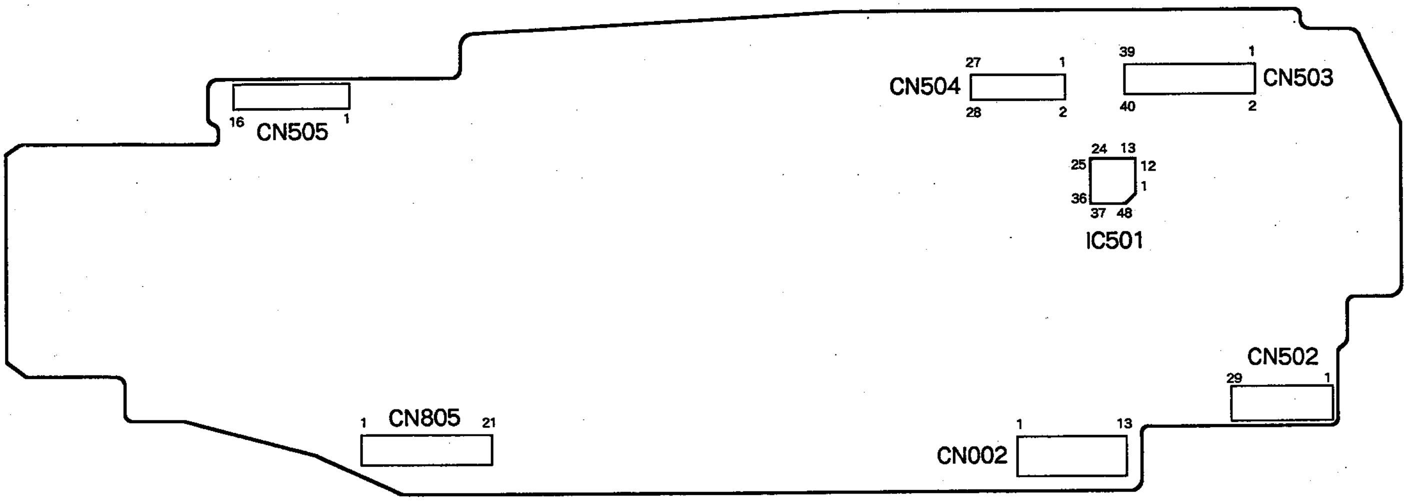
CS-31 BOARD (CONDUC



CS-31 BOARD (COMPONENT SIDE)
(Also illustrated on page 250.)


CT801
28MHz Original Oscillation
2
1
18
17
CN701
1
17
CN801
CN001
1
5

CS-31 BOARD (CONDUCTOR SIDE)


16
CN505
1
27
1
CN504
28
2
39
1
CN503
40
2
24
13
25
12
1
36
37
48
IC501
CN502
29
1
1
CN805
21
1
13
CN002

SECTION 8

MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)

For setting of the track shift mode, however, refer to the following.

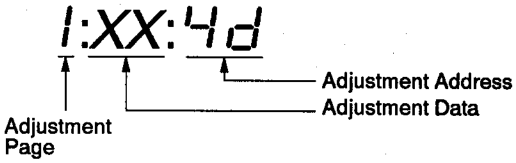
8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.

   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.

   CH1: CS-31 board CN001 pin ③ (PB RF)

   CH2: CS-31 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1NP: 8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

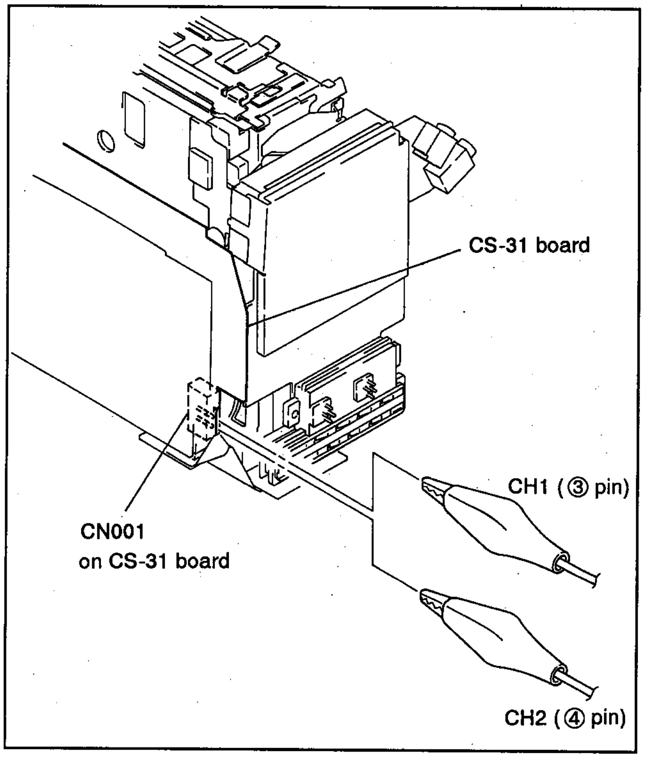


Fig.8-1.

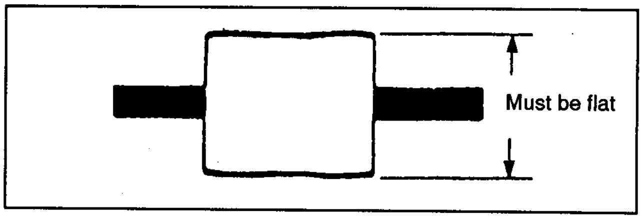


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 250.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
        Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
        Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)$^{\text{Note 1}}$
        Part Code: 8-967-995-51
    (WR5-5NSP)$^{\text{Note 2}}$
        Part Code: 8-967-995-42
    Note: The following alignment tapes can also be used.
        1) WR5-3NL (8-967-995-31)
        2) WR5-4NSP (8-967-995-41)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-71 board extension cord (20P, 0.8 mm)
        Part Code: J-6082-169-A
14) VA-71 board extension cord (40P, 0.8 mm)
        Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
        Part Code: 6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video power switch ·········Position of the video
- Input/output switchover switch
  ··········· Input position (Record mode)
  Output position (Playback mode)
- Connect the adjusting remote control unit to the remote terminal (PS-282 board J951).

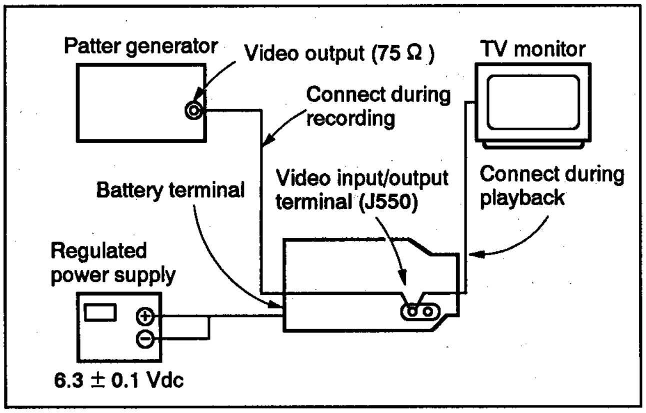

Patter generator
Video output (75 Ω)
TV monitor
Connect during recording
Battery terminal
Video input/output terminal (J550)
Connect during playback
Regulated power supply
6.3 ± 0.1 Vdc

Fig. 9-1.

9-1-3. Precautions upon adjustment

The MA-93 board (Mic amplifier) is not required for adjusting the video section.
Remove the following connector when removing the EVF section.

1. VK-22 board CN571 (8 PIN)

- Remove the following connector if the focus ring gets in the way.
  1. CN852 of CS-31 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-31 board (18 pins)
  2. CN851 of the CS-31 board (20 pins)
  3. CN902 of the CD-61 board (5 pins)

- Use an extension cable when opening the VA-71 board.
  1. Between CN201 of VA-71 board and CN503 of CS-31 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-71 board and CN504 of CS-31 board.
     20 pins, 0.8 mm pitch extension cable (J-6082-169-A)

- Use an extension cable when opening the CS-31 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-31 board and FP-425 board.
     30 pins, 0.8 mm pitch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-31 board (16 pins)

[How to set the forced POWER ON mode]
1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/VTR) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]
1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-71 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

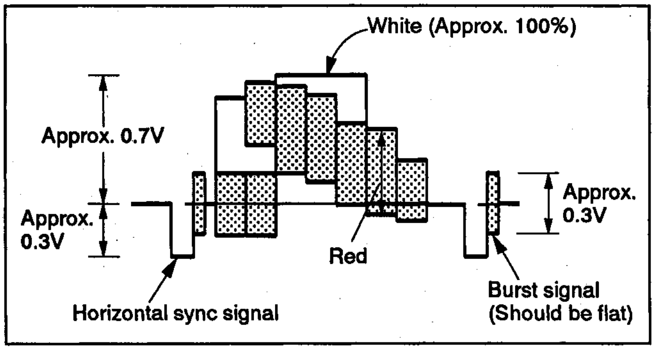


Fig. 9-2. Color Bar Signal of the Pattern Generator

9-1-5. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record -ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } Color bar section 400 Hz 20 sec. 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

Note: Recording mode

L	Original mode
E	hi8 (hi band) mode

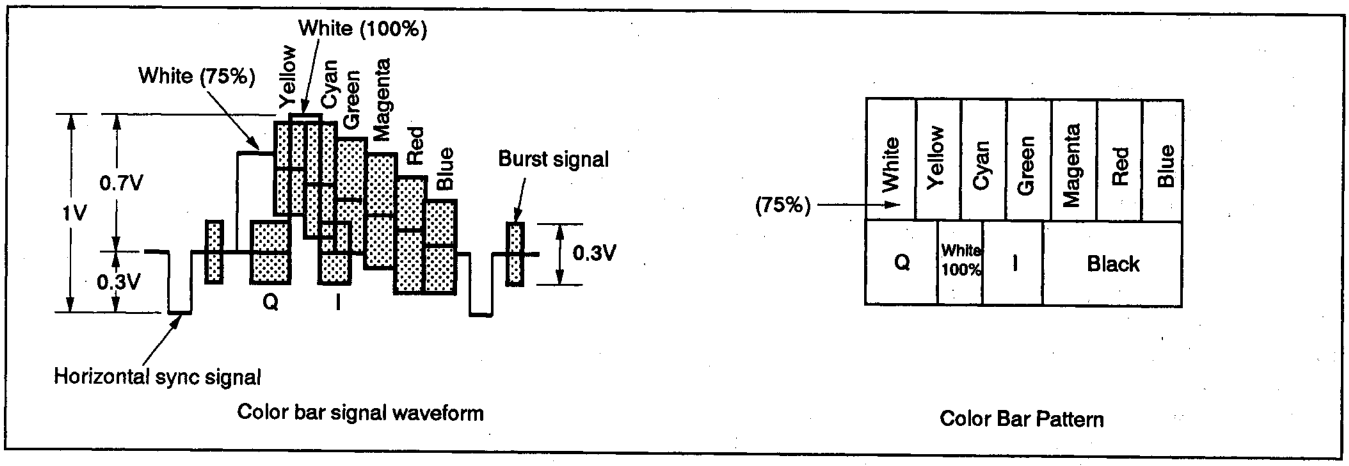
Tape type

MP	Applying metal tape
ME	Steam metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video input/output terminal (Terminated at 75 Ω)



Color bar signal waveform

Color Bar Pattern

Fig. 9-3. Color Bar Signals of the Alignment Tape

9-1-6. Input/Output Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75 Ω unbalanced, sync negative
Video output	Pin jack Output signal: 1 Vp-p, 75 unbalanced, sync negative
Audio input	Pin jack Input level: –7.5 dBs (odBs=0.775 Vrms) Input impedance: Above 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: Below 2.2 kΩ

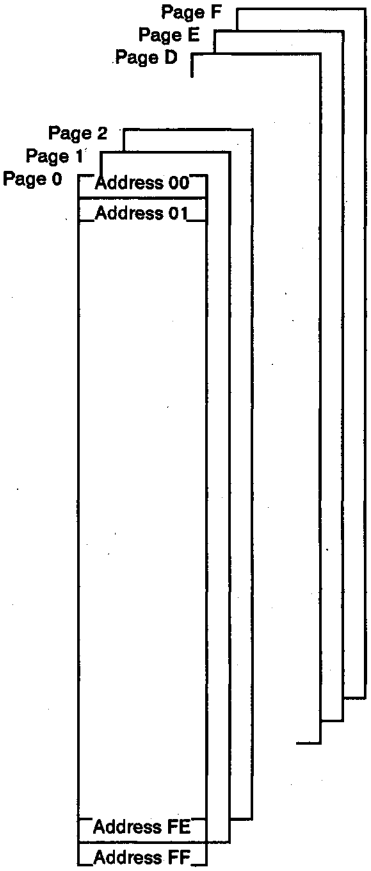
9-1-7. Service Mode

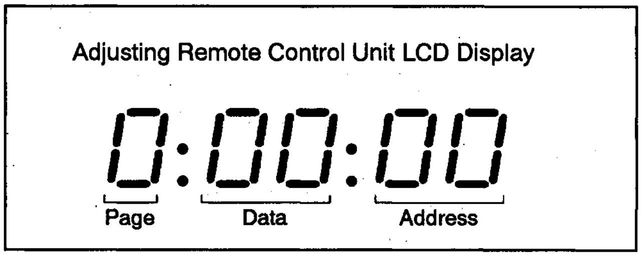
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

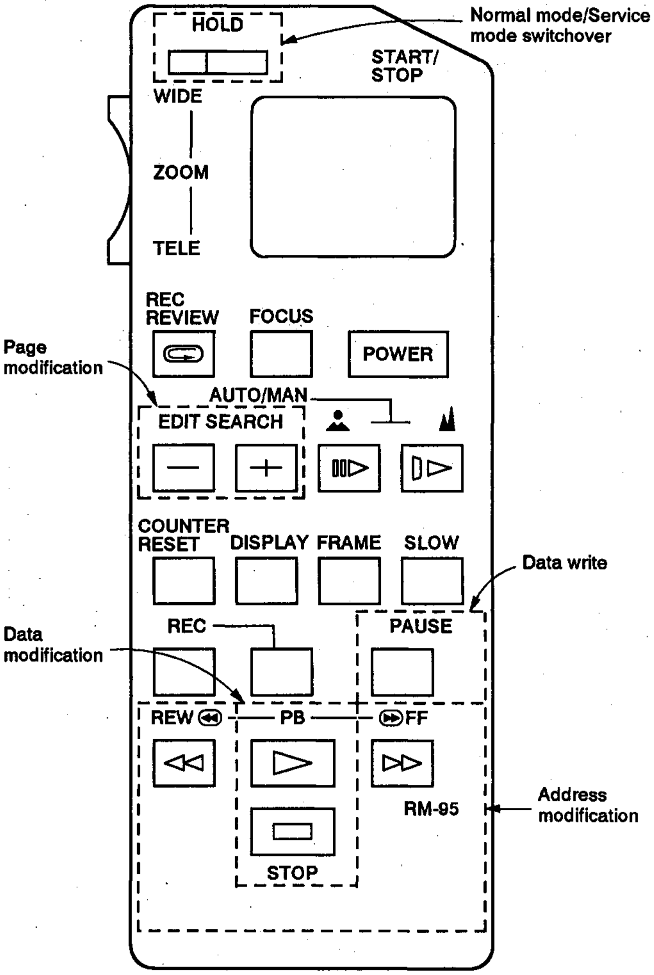
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

(1) Service LANC memory map


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

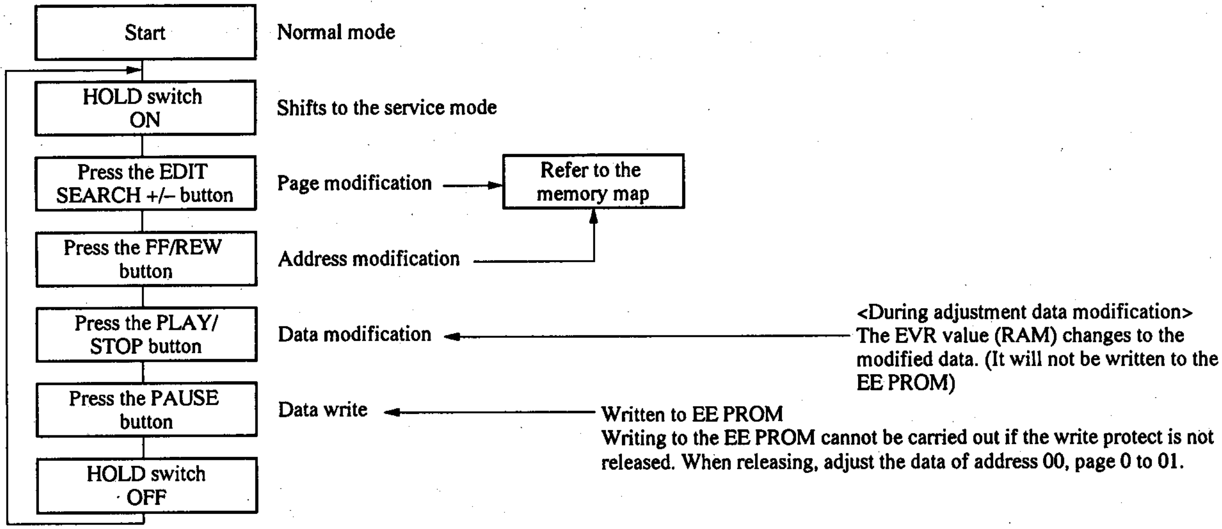

Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

Adjusting remote control unit RM-95 (J-6082-053-A)


HOLD
Normal mode/Service mode switchover
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
REC
PAUSE
Data modification
REW
PB
FF
RM-95
Address modification
STOP

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch · OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

······The first error code generated

Page D	Address 07

Last emergency code

······ The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode

……The operation mode when the first error is generated

Page D	Address 09

Last emergency mode

……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.

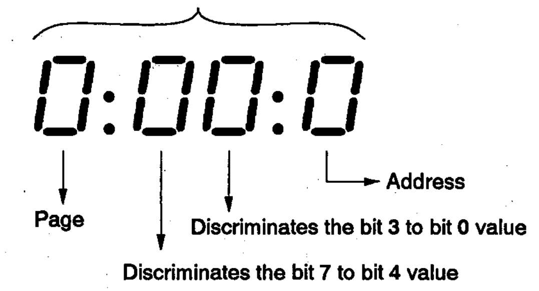
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	–X1
37	–1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	–1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	–X2
77	–FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.

Adjusting remote control unit display


0:00:0
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

	Remote Control Unit Display	Bit Value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A(A)	1	0	1	0
	B(b)	1	0	1	1
	C(c)	1	1	0	0
	D(d)	1	1	0	1
Ⓑ→	E(E)	1	1	1	0
	F(F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

Bit3: "1"=Recording impossible / "0"=Recording possible

Bit2: "1"=ME tape / "0"=MP tape

Bit1: "1"=Hi8 mode playback / "0"=Normal mode playback

Bit0: "1"=HG tape / "0"=Others

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

Bit2: "0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

Bit0: "1"=LP mode playback / "0"=SP mode playback

Bit1: "1"=SYNC is detected / "0"=SYNC is not detected

Bit2: "1"=CLOG is detected / "0"=Normal

Bit3: "1"=When the PB RF signals are being playback normaly / "0"=Others

Bit4: "1"=JOG mode / "0"=Other

Bit5: "1"=Playback mode / "0"=Others

Bit6: "1"=AUDIO MUTE: ON / "0"=AUDIO MUTE: OFF

Bit7: "1"=VIDEO MUTE: ON / "0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

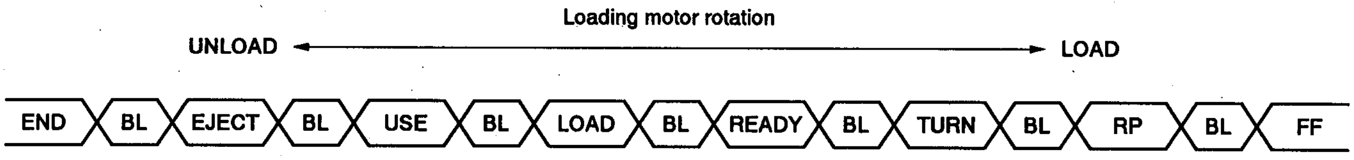
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
0	0	0	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)		AE PORTRAT	CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)		AE SPORTS	REMOTE ON/OFF		TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)		AE SHUTTER	EVENT	TIME	DATE	PAUSE	REC	
Address 6C (K OUT 4)				BACK LIGHT	FADER			
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF						

14. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		49	49
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	3E	3E
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	3E	3E
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	3E	3E
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	3E	3E
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	3E	3E
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue], not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue], not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green], not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green], not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue], not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue], not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red], not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red], not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet], not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet], not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow], not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow], not used		
20		X2MUTE, SIRCS EJECT etc	0C	0C
21		FORCED VTR ON, CAM ON etc DATA — MODE 01 — FORCED CAMERA POWER ON 02 — FORCED VTR POWER ON	00	00
22~2C		Not used		

Table 9-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
2D		Amount of remaining battery	A3	
2E		Amount of remaining battery	9C	
2F		Amount of remaining battery	97	
30~39		Not used		
3A	MT 1’CH	Not used [IC204 ④]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ②]	C0	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ③]	C0	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	62	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ⑤]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ⑤]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	6C	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A4	
4D	SR-IR	IR adjustment [IC203 ②]	A4	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	9B	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	95	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	6F	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	6F	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	CF	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	69	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	81	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	93	
5C~77		Not used		
78	REC/PB MATRIX	Not used		
79		Not used		
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑥]	72	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑦]	91	
7C	1.7 IR	Not used		
7D	1.7 DEV	Not used		
7E	AUDIO FADER	Audio fader [IC204 ⑩]		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	475 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-282 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.01 ± 0.15 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.05 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–9.0 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-7. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7D

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

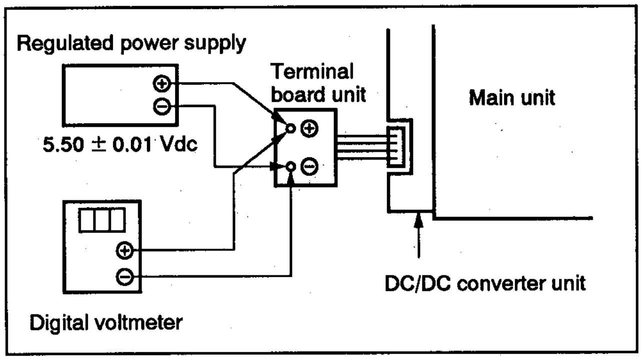


Fig. 9-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D10.
6) Set data D10 to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Set data: 00 to page: 4, address: 01.
   (Test mode 1 release)
8) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.65 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.54 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.30 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-31 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF CH2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

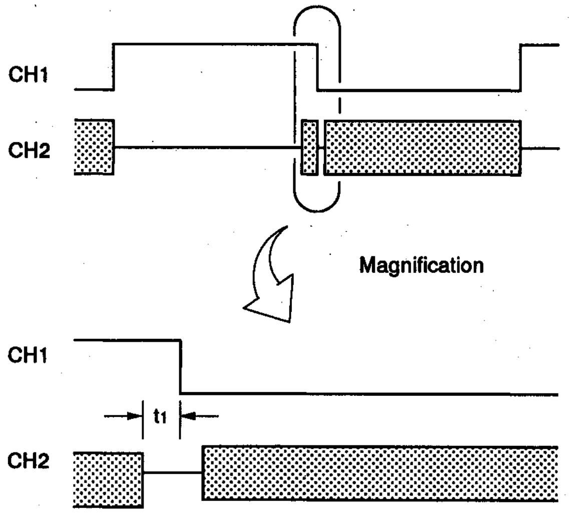


Fig. 9-5.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-2.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-31 board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

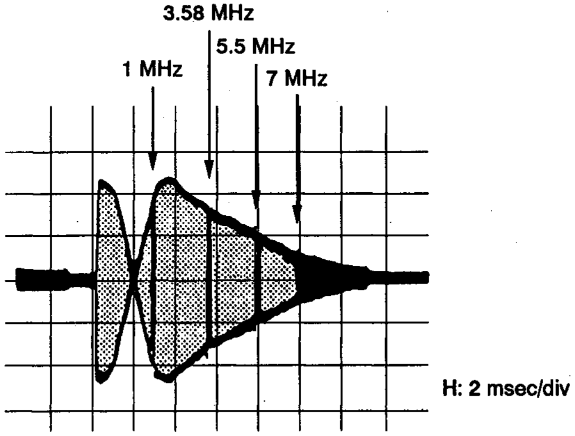


Fig. 9-6.

2. Flying Erase Check (CS-31 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.5 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.5 MHz and that the oscillation voltage is above 7.0 Vp-p.

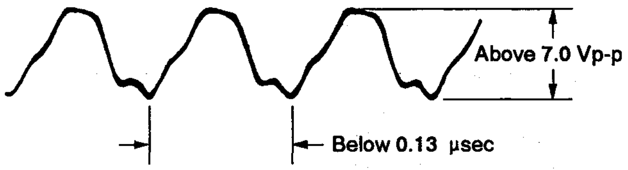


Fig. 9-7.

3. VXO Oscillation Frequency Check (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 3579545 ± 70 Hz.

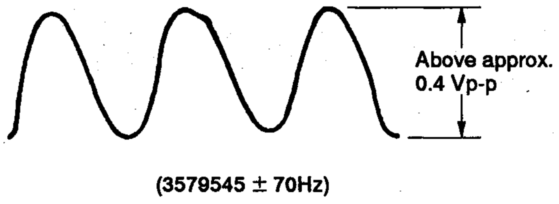


Fig. 9-8.

4. EE Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of CN400 (VIDEO OUT)[Note]
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ③ of CN400 at 75 Ω.
After completing adjustments, remove the 75 Ω resistor.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

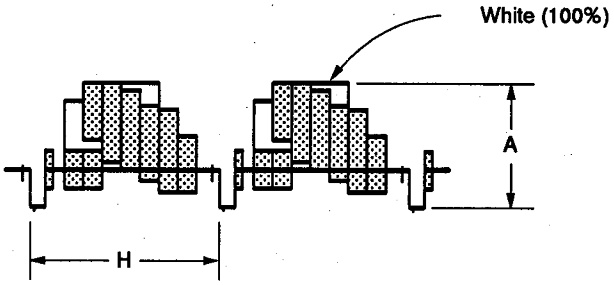


Fig. 9-9.

5. IR Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 50 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin (51) of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

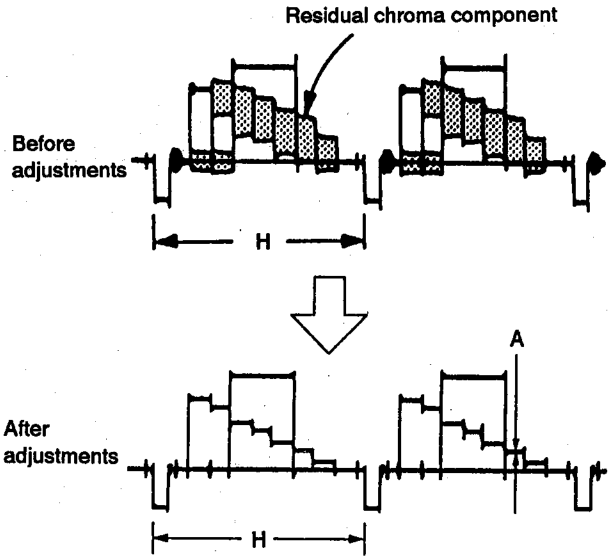


Fig. 9-10.

6. Chroma Comb Filter Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

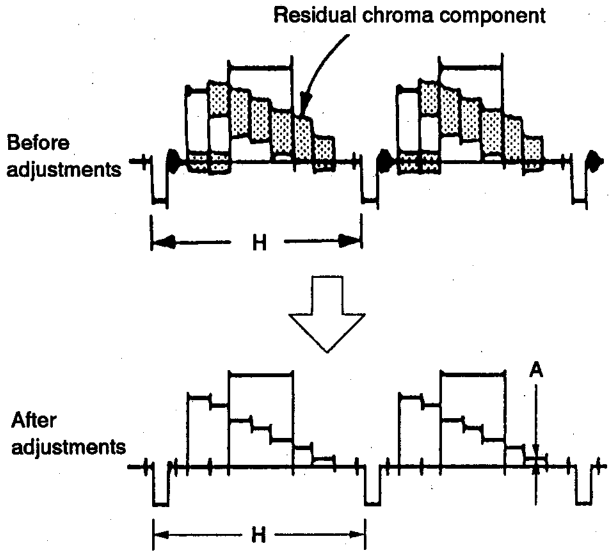


Fig. 9-11.

7. Emphasis Input Level Adjustment (VA-71 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

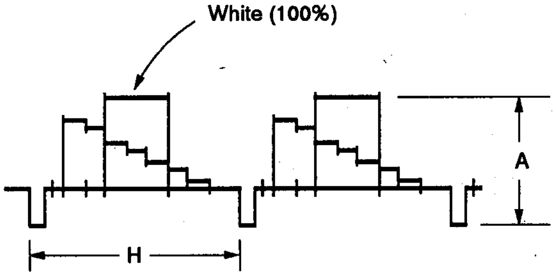


Fig. 9-12.

8. PB Y Level Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

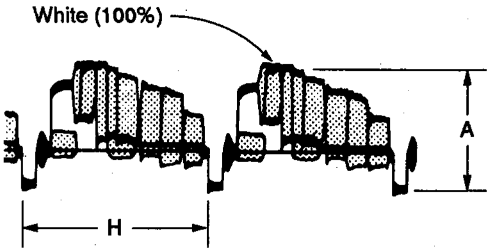


Fig. 9-13.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

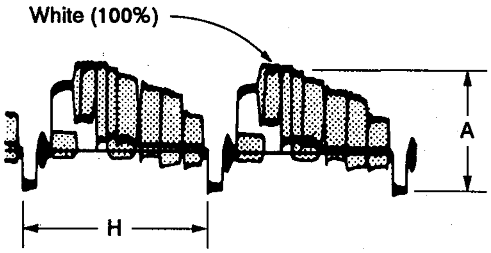


Fig. 9-14

10. Y FM Carrier Frequency Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

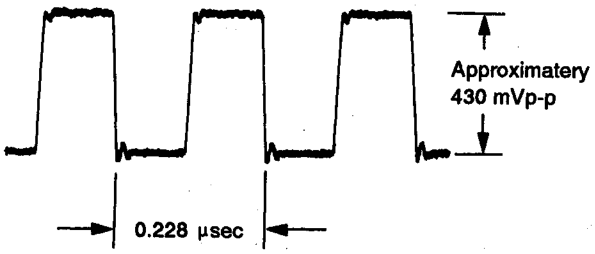


Fig. 9-15.

11. Deviation Adjustment (VA-71 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

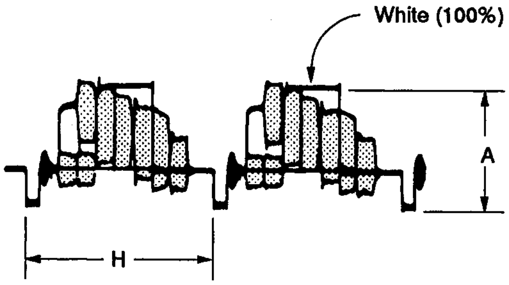


Fig. 9-16.

12. Chroma Emphasis fo Adjustment (VA-71 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method
1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

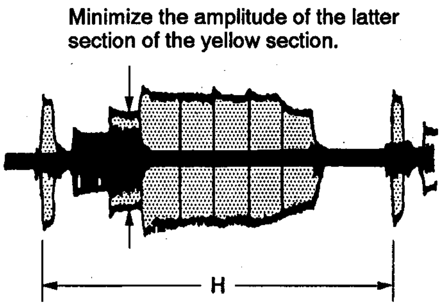

Minimize the amplitude of the latter section of the yellow section.
H

Fig. 9-17.

13. REC Y Level Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	A=220 ± 5 mVp-p

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set the same data of address: 55 to address: 54.
5) Press the PAUSE button of the remote control unit.

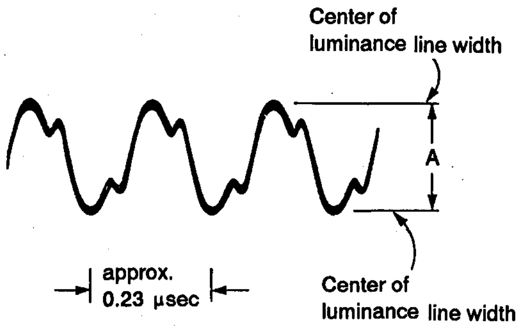

Center of luminance line width
A
approx. 0.23 µsec
Center of luminance line width

Fig. 9-18.

14. REC C RF Level Adjustment (VA-71 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46
Specified Value	A=110 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

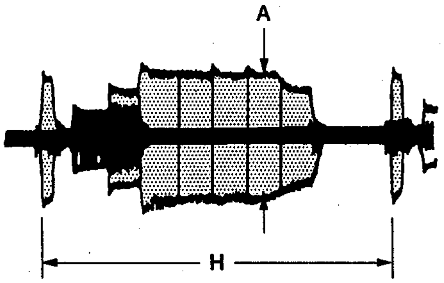


Fig. 9-19.

15. REC ATF Level Checking (CS-31 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method
1) Confirm that the REC ATF signal level (A) satisfies the specified value.

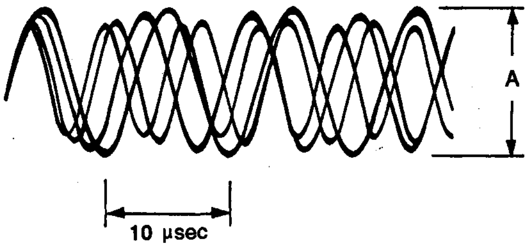


Fig. 9-20.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-21, and perform adjustments with the power switch [video] position.
Set the input/output select switch in accordance with the mode as follows.

- Input position ·······Recording mode
- Output position·····Playback mode

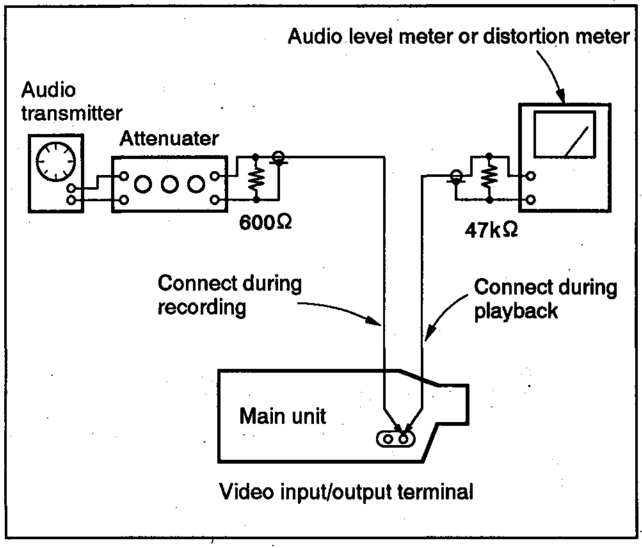


Fig. 9-21.

[Adjustment Procedure]

1) Carrier frequency check
2) Recording level check
3) E-E output level check
4) IR adjustment
5) Deviation adjustment
6) Overall level characteristics, distortion check
7) Overall noise level check

1. Carrier Frequency Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. Record Level Check (VA-71 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=48 ± 8 mVp-p

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
(Read the center of the luminance line width and note down the level read.)

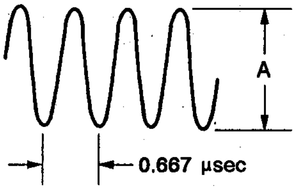


Fig. 9-22.

3. E-E Output Level Check (VA-71 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal
Measurement Point	Pin ⑲ of IC401 or Pin ① of IC400
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

4. IR Adjustment (VA-71 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	+: Pin ⑥ of IC401 –: Pin ㊹ of IC401 (C428 ⊕)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7A and adjust so that the DC voltage becomes 0 ± 10 mVdc.
3) Press the PAUSE button of the adjusting remote control unit.

5. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

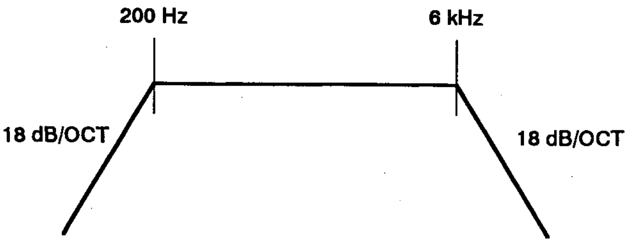


Fig. 9-23.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal.
2) Record the signal.
3) Remove the input signal, and set the input/output select switch to [out].
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2 dBs, and that the distortion rate is below 0.5% (Note 1).

7. Overall Noise Level Check

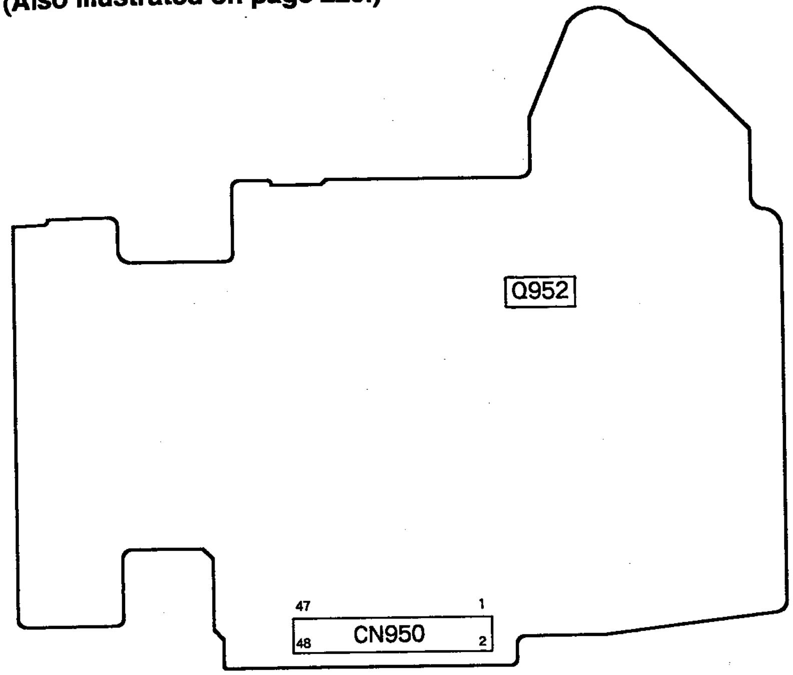
Mode	Self recording
Signal	No signal: Audio output terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

Checking method:

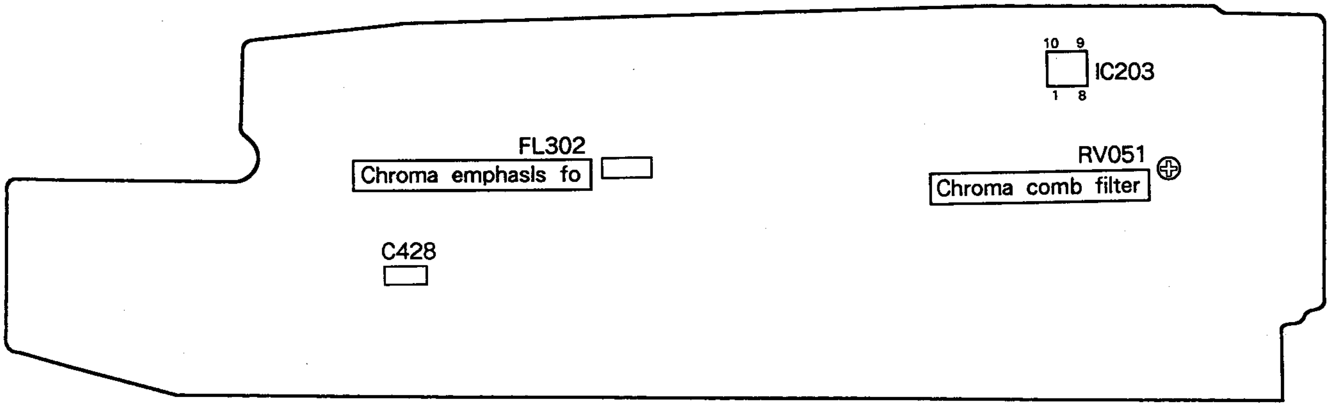
1) Insert the shorting plug to the audio input terminal.
2) Record.
3) Remove the shorting plug, and set the input/output select switch to [out].
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal is below –65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

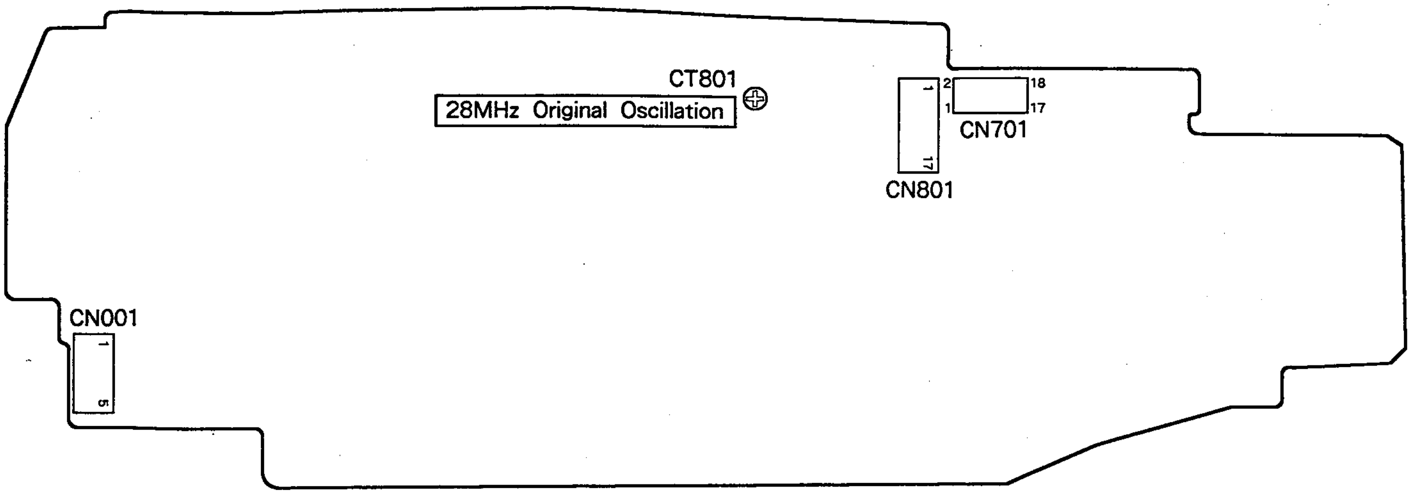
PS-282 BOARD (COMPONENT SIDE)
(Also illustrated on page 220.)


Q952
47
1
48
CN950
2

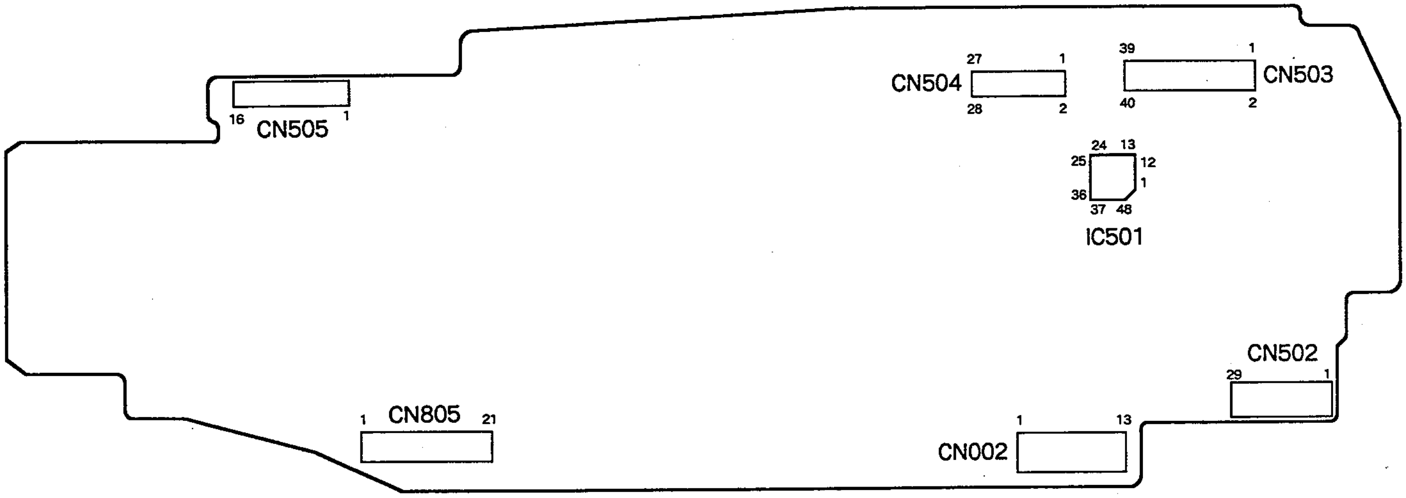
VA-71 BOARD (COMPONENT SIDE)


10 9
IC203
1 8
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

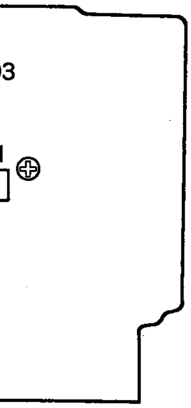
CS-31 BOARD (COMPONENT SIDE)
(Also illustrated on page 220.)

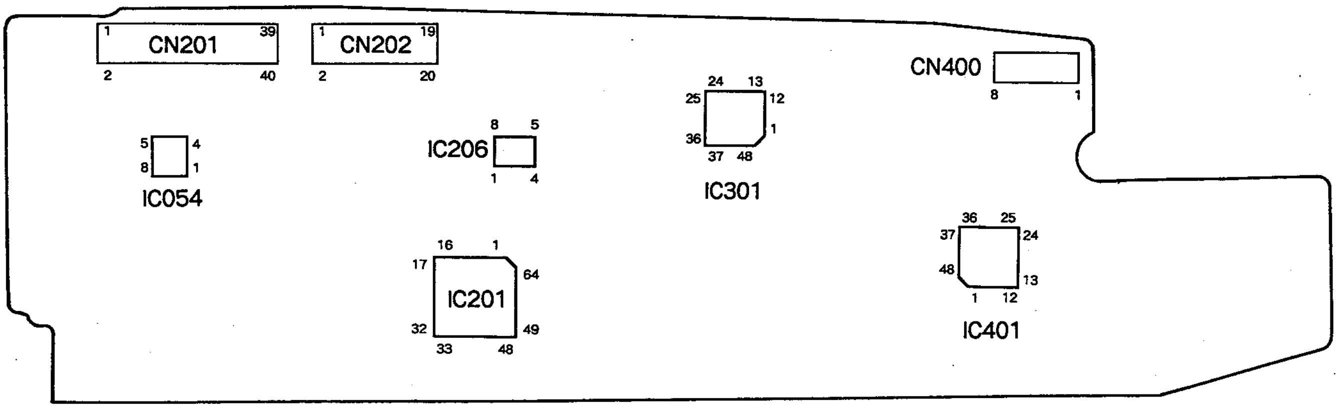

CT801
28MHz Original Oscillation
CN701
2
1
18
17
CN801
1
17
CN001
1
5

CS-31 BOARD (CONDUCTOR SIDE)


CN505
16
1
CN504
27
1
28
2
CN503
39
1
40
2
IC501
24
13
25
12
1
36
37
48
CN502
29
1
CN805
1
21
CN002
1
13

VA-71 BOARD (CONDUCTOR SIDE)




CN201
1
39
2
40
CN202
1
19
2
20
CN400
8
1
IC054
5
4
8
1
IC206
8
5
1
4
IC301
24
13
25
12
1
36
37
48
IC201
16
1
17
64
32
49
33
48
IC401
36
25
37
24
48
13
1
12

9-973-201-11

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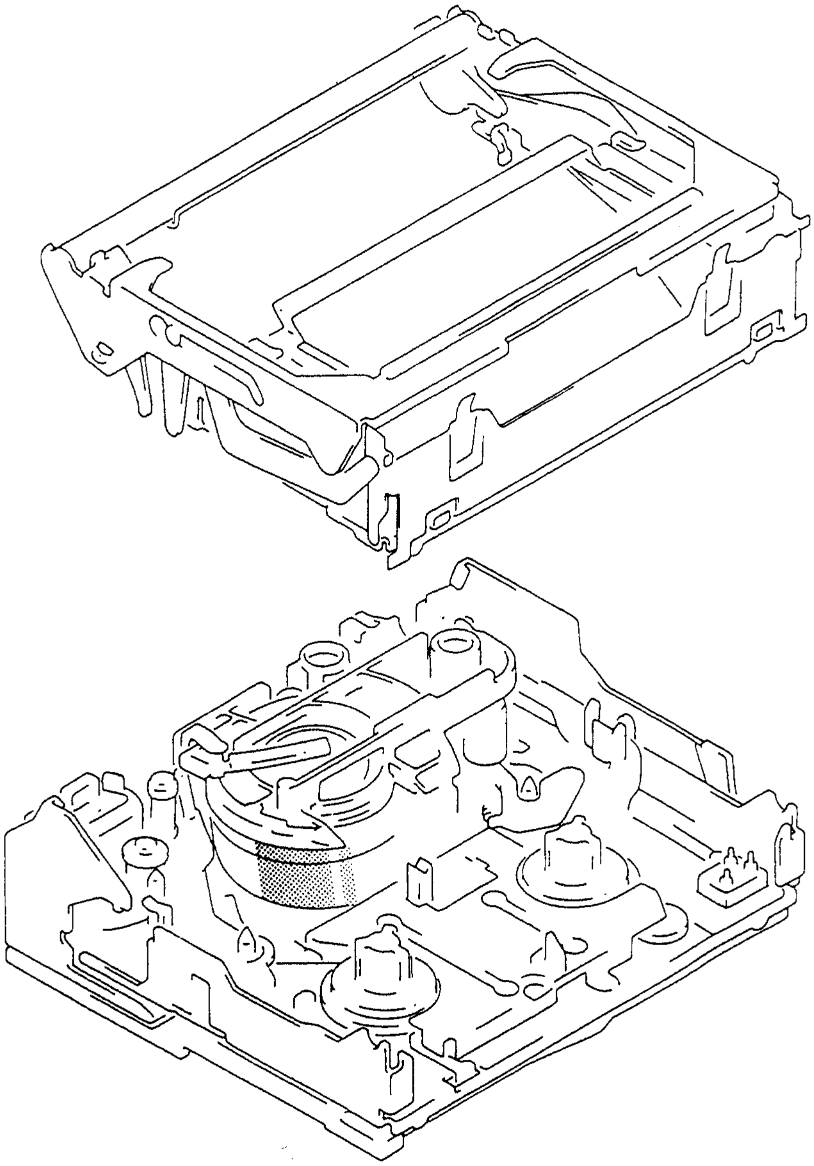
8 mm Video MECHANICAL ADJUSTMENT MANUAL IV

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the $\boxed{\text{USE}}$ mode. (To select the $\boxed{\text{USE}}$ mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the $\boxed{\text{USE}}$ mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

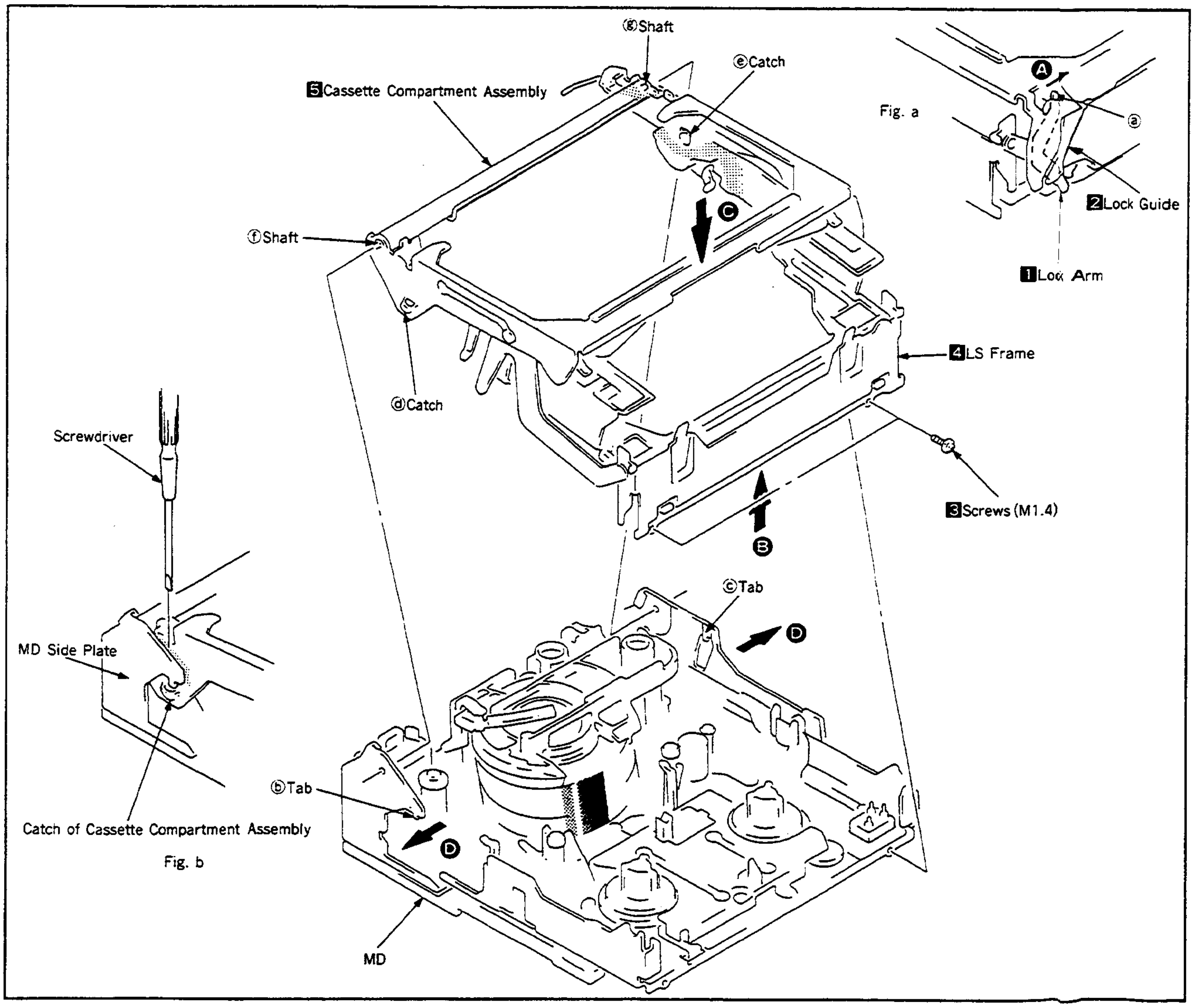

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
ⓕShaft
🅒
❹LS Frame
ⓓCatch
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
🅓
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder ❻ of cassette compartment assembly ❺ toward the arrow 🅔, and lower the LS frame ❹ toward the arrow 🅕.
3) With the cassette compartment assembly ❺ tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly ❺ so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm ❶ of cassette compartment assembly must be inserted into a groove in the guide rail ❼ on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame ❹ inside the LS chassis ❽.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws ❸.

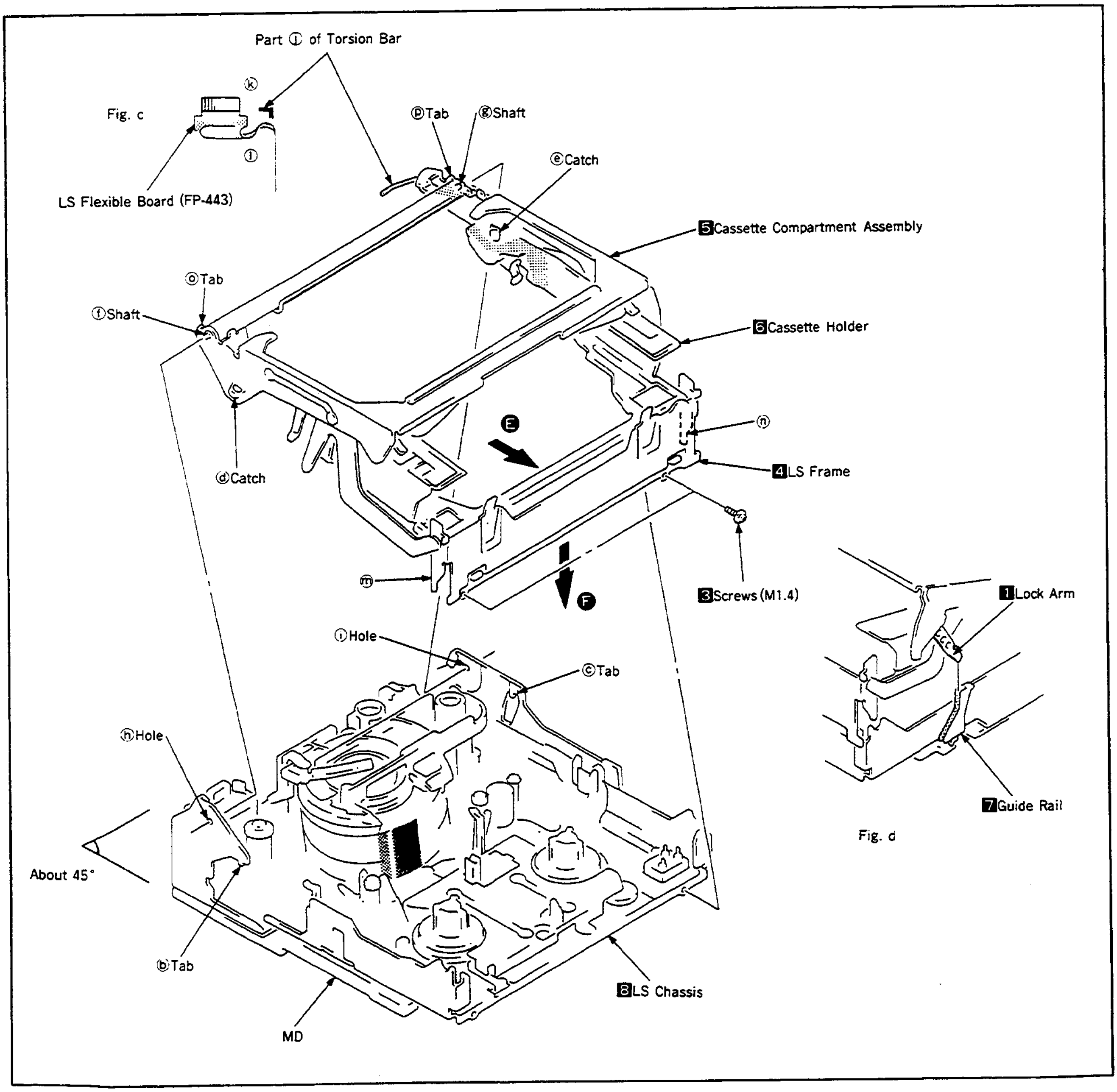

Part ⓙ of Torsion Bar
Fig. c
ⓚ
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
ⓞTab
ⓕShaft
❻Cassette Holder
🅔
ⓝ
ⓓCatch
❹LS Frame
ⓜ
🅕
❸Screws (M1.4)
❶Lock Arm
ⓘHole
ⓒTab
ⓗHole
❼Guide Rail
Fig. d
About 45°
ⓑTab
❽LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap ❷ on the Reflector C ❶.
3) Press the pin of the push switch ❸ (ON state) and fix it with adhesive tape ❹ in that state.

Note : Press the asterisked (＊) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch ❺ in an arrow direction as shown in Fig. a.

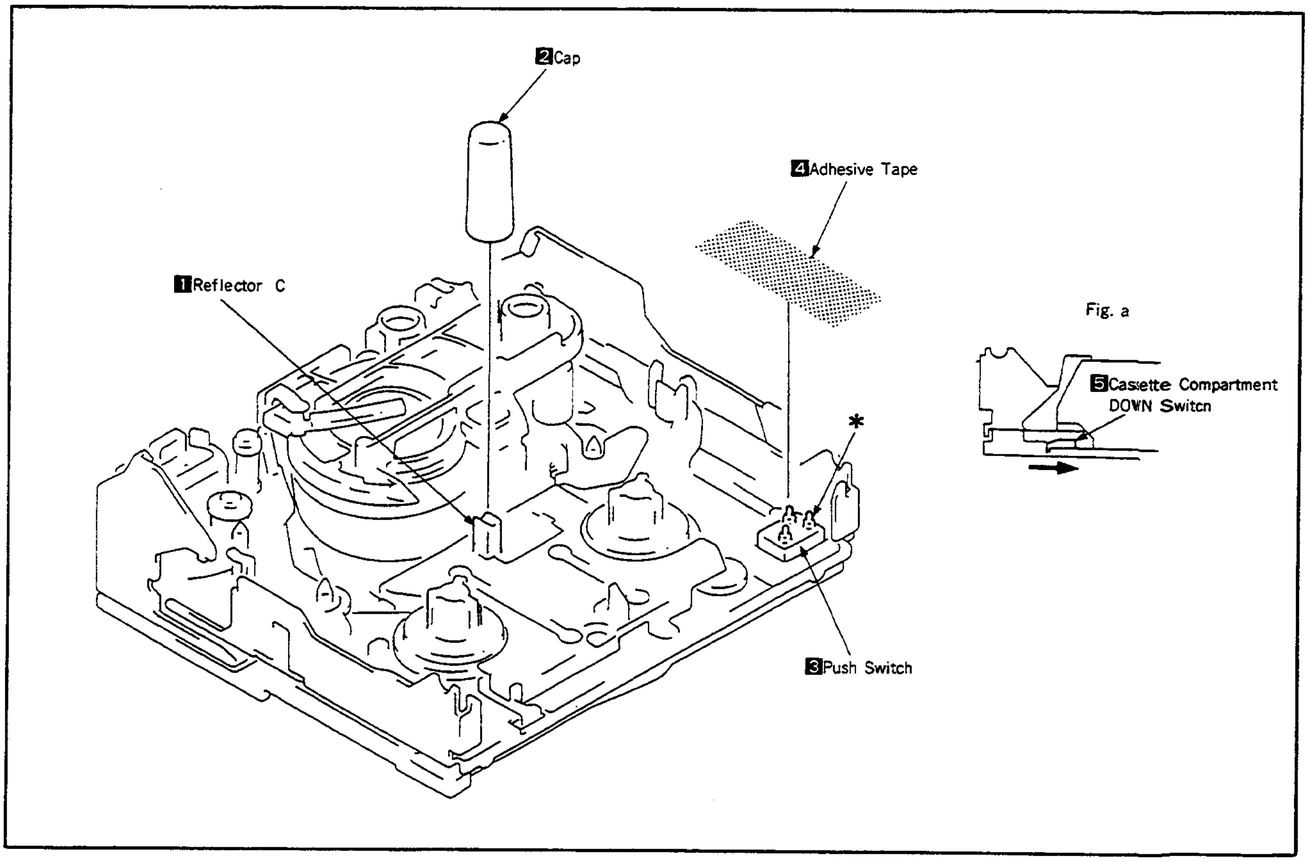

❷Cap
❹Adhesive Tape
❶Reflector C
Fig. a
❺Cassette Compartment
DOWN Switcn
*
❸Push Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector.
  U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

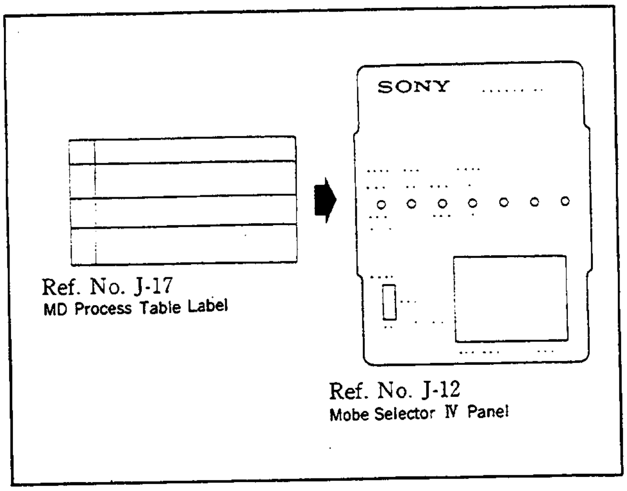

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

1 Construction (Fig.5)

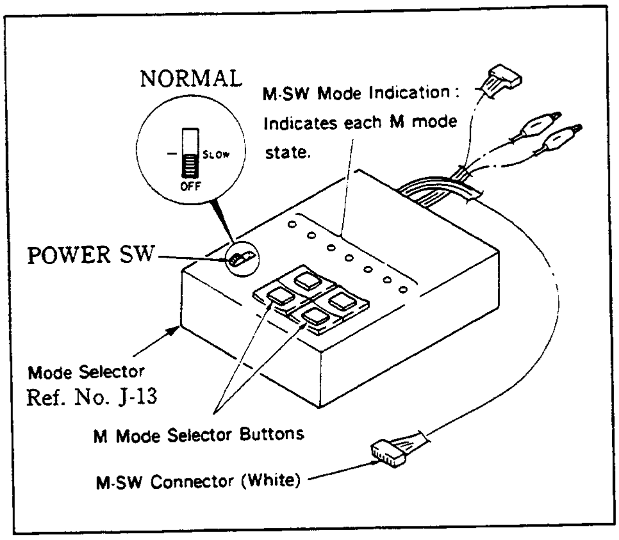

NORMAL
SLOW
OFF
M-SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector ❶ and M-SW connector ❷ into the mode selector IV conversion connector ❸ respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

For CCD-FX410 series

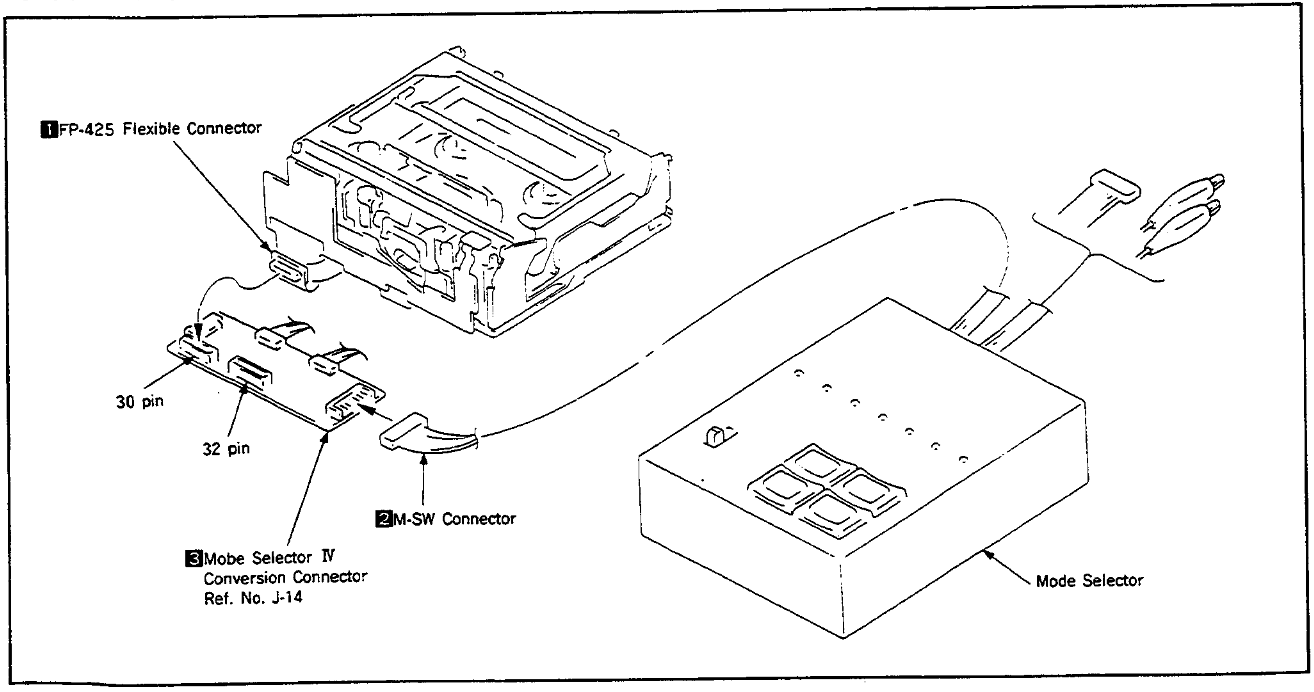
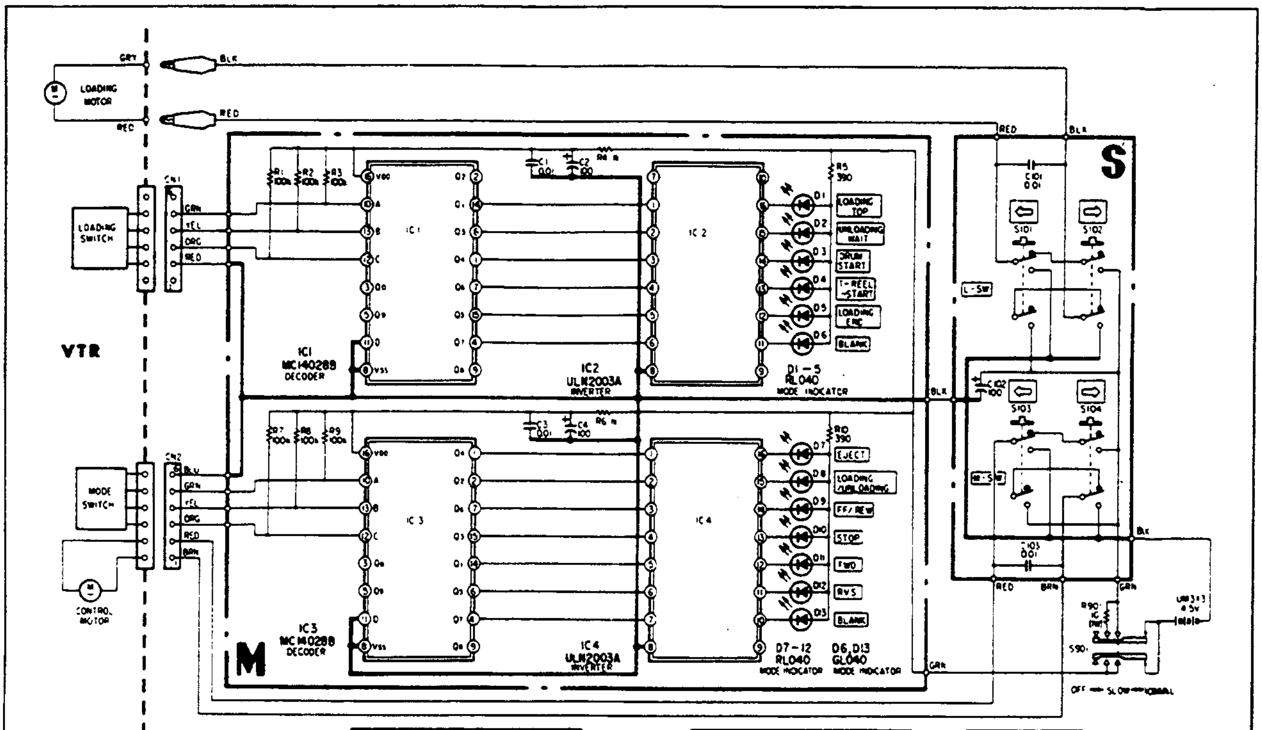

❶FP-425 Flexible Connector
30 pin
32 pin
❷M-SW Connector
❸Mobe Selector Ⅳ Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
RED
LOADING MOTOR
LOADING SWITCH
MODE SWITCH
CONTROL MOTOR
VTR
CN1
CN2
GRN
YEL
ORG
RED
BLU
BRN
R1 100k
R2 100k
R3 100k
R4 1k
R5 390
C1 0.01
C2 100
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
D1
D2
D3
D4
D5
D6
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL START
LOADING END
BLANK
D1–5 RL040 MODE INDICATOR
R7 100k
R8 100k
R9 100k
R6 1k
R10 390
C3 0.01
C4 100
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D7
D8
D9
D10
D11
D12
D13
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7–12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
S
M
C101 0.01
C102 100
C103 0.01
S101
S102
S103
S104
L-SW
M-SW
R901
S901
OFF → SLOW → NORMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH ⇦	SWITCH ⇨	DIRECTION OF MOTOR REVOLUTION
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description
		CAPACITOR
C1	1-108-579-00	MILER 0.01μF 50V
C2	1-123-333-00	ELECT 100μF 24V
C3	1-108-579-00	MILER 0.01μF 50V
C4	1-123-333-00	ELECT 100μF 24V
C101	1-108-579-00	MILER 0.01μF 50V
C102	1-123-333-00	ELECT 100μF 24V
C103	1-108-579-00	MILER 0.01μF 50V
		DIODE
D1	8-719-812-31	DIODE TLR123
D2	8-719-812-31	DIODE TLR123
D3	8-719-812-31	DIODE TLR123
D4	8-719-812-31	DIODE TLR123
D5	8-719-812-31	DIODE TLR123
D6	8-719-812-33	DIODE TLG123A
D7	8-719-812-31	DIODE TLR123
D8	8-719-812-31	DIODE TLR123
D9	8-719-812-31	DIODE TLR123
D10	8-719-812-31	DIODE TLR123
D11	8-719-812-31	DIODE TLR123
D12	8-719-812-31	DIODE TLR123
D13	8-719-812-33	DIODE TLG123A

Ref. No	Part No.	Description
		IC
IC1	8-752-240-28	IC TC4028BP
IC2	8-752-120-03	IC μPA2003C
IC3	8-759-240-28	IC TC4028BP
IC4	8-759-120-03	IC μPA2003C
		RESISTOR
R1	1-247-179-00	CARBON 100K 1/4W
R2	1-247-179-00	CARBON 100K 1/4W
R3	1-247-179-00	CARBON 100K 1/4W
R4	1-247-131-00	CARBON 1K 1/4W
R5	1-247-121-00	CARBON 390 1/4W
R6	1-247-131-00	CARBON 1K 1/4W
R7	1-247-179-00	CARBON 100K 1/4W
R8	1-247-179-00	CARBON 100K 1/4W
R9	1-247-179-00	CARBON 100K 1/4W
R10	1-247-121-00	CARBON 390 1/4W
R901	1-214-594-00	METAL 10 1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

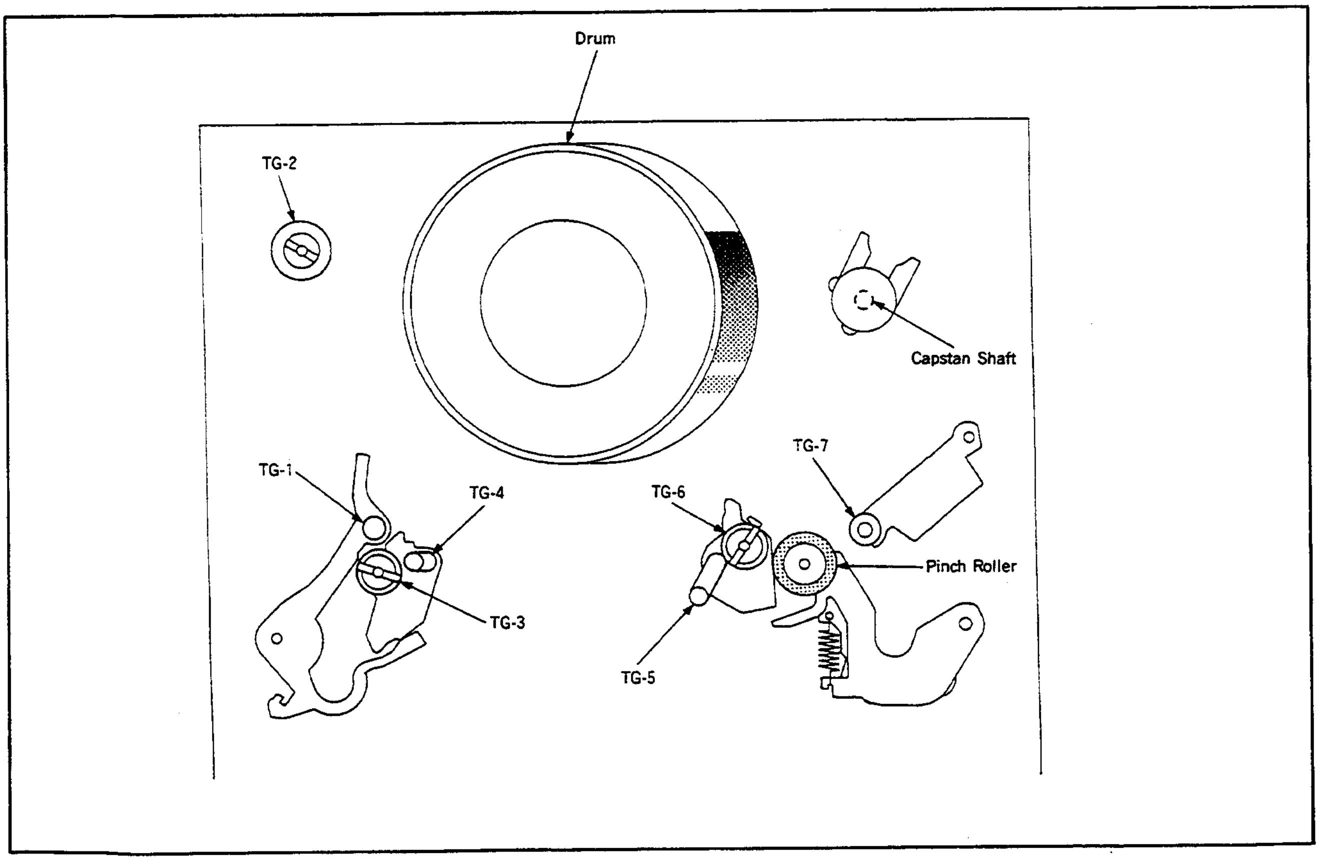


Fig. 7

2-3. PERILDIC CHECK ITEMS

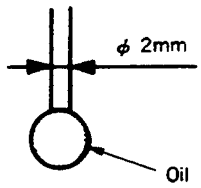
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different visicosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

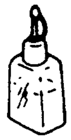


2-4. Service jigs list

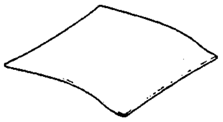
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment ● Oscilloscope
● Analog tester (20 kΩ)

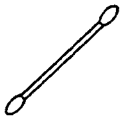
J-1



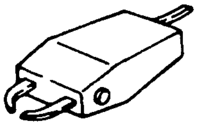
J-2



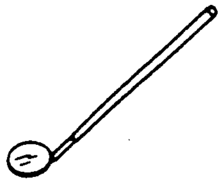
J-3



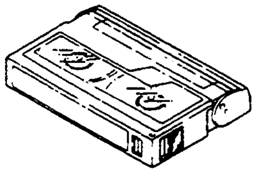
J-4



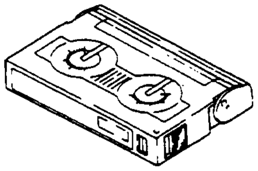
J-5



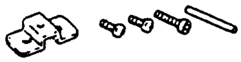
J-6



J-9

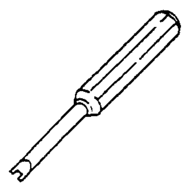


J-10

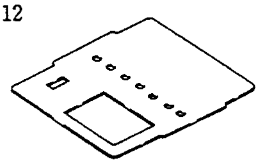


(Attached to the maintenance rotary upper drum)

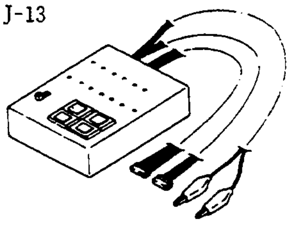
J-11



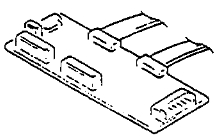
J-12



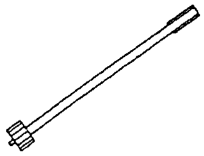
J-13



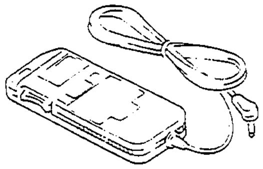
J-14



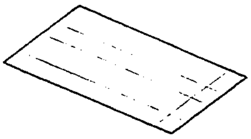
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

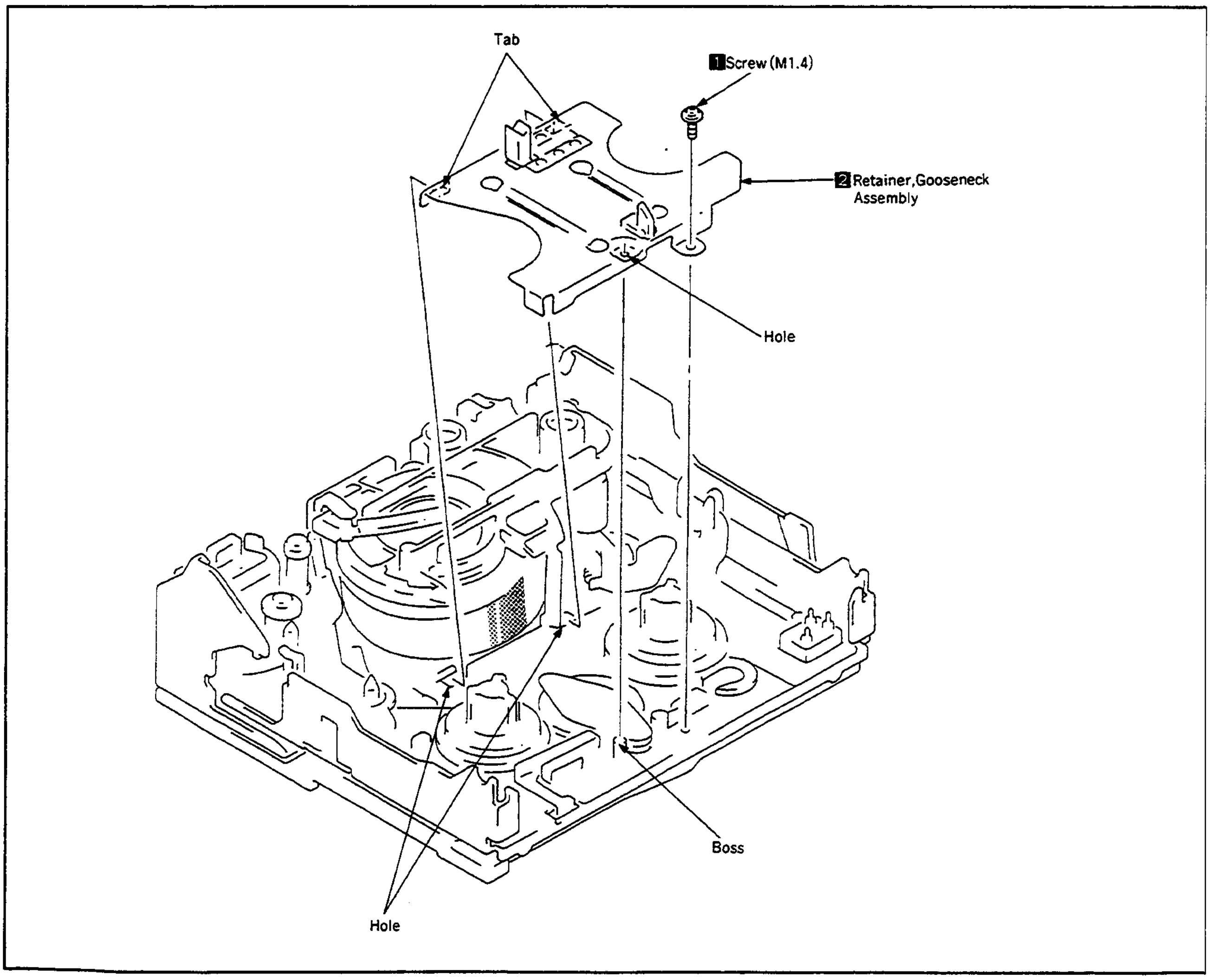


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws ❶, then the protector base assembly ❷.

2. Mounting

1) Mount the protector base assembly ❷ with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder ❸.
2) Tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

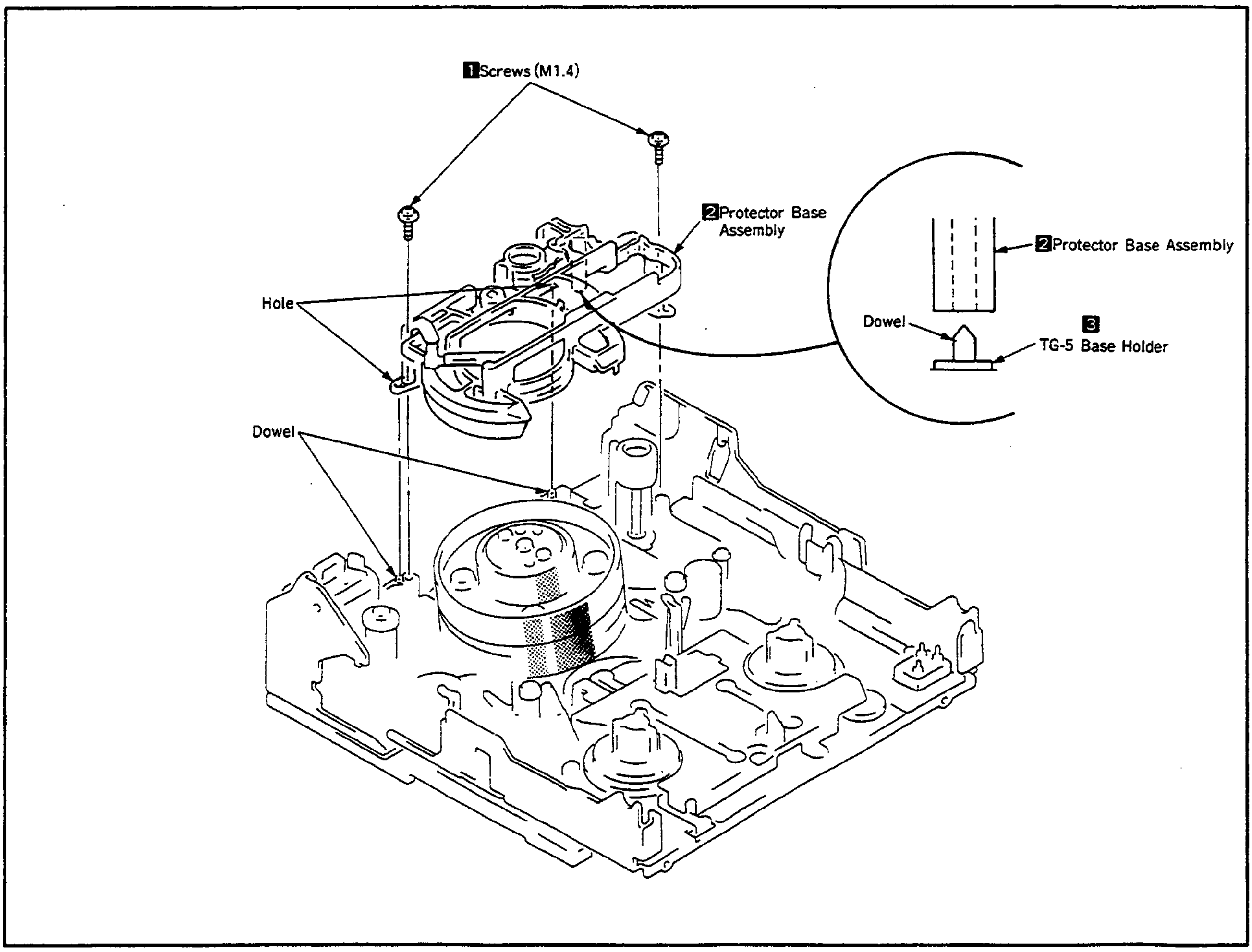

❶Screws (M1.4)
❷Protector Base Assembly
Hole
Dowel
❷Protector Base Assembly
Dowel
❸
TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ■1 on the back of MD.
4) Remove three screw ■2, then the drum assembly ■3.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2. Mounting

1) Mount the drum assembly ■3 while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2) Tighten three screw assemblies ■2 in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ■1 on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

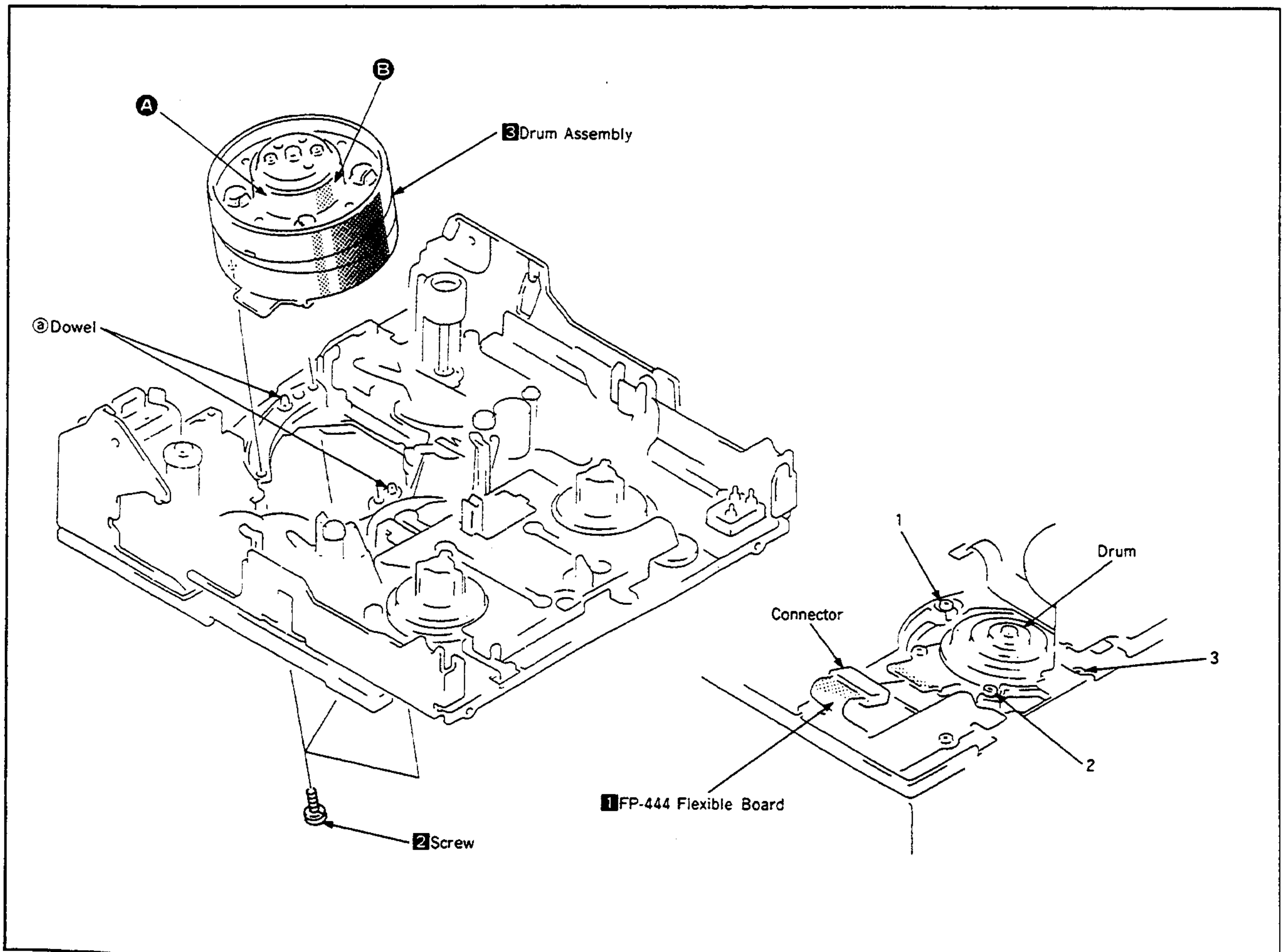


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw ❶, then the capstan cover ❷.
3) Remove the screw ❸, then the capstan motor assembly ❹.

2. Mounting

1) Mount the capstan motor assembly ❹ and tighten the scre ❸.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover ❷ and tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

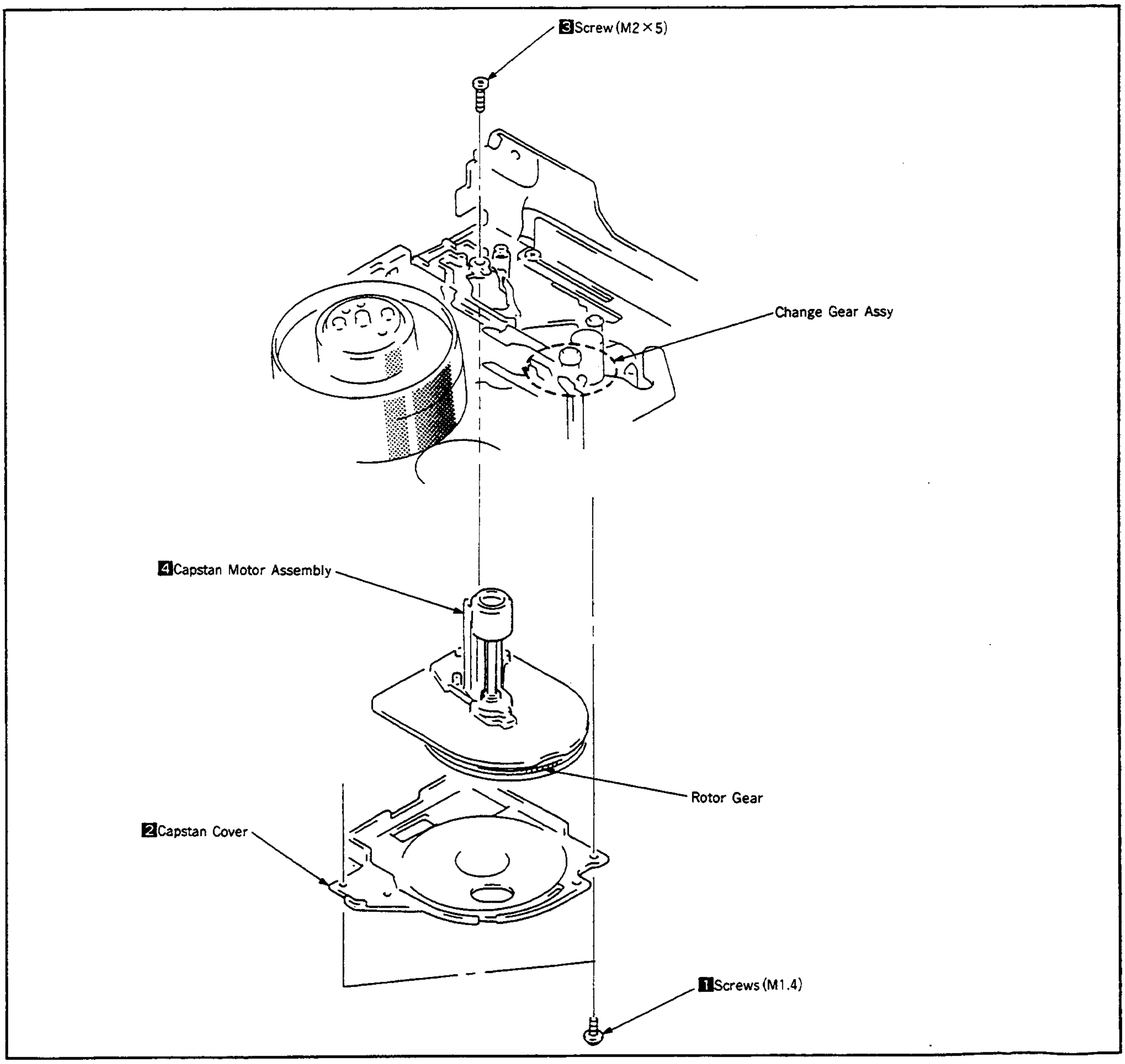

❸Screw (M2 × 5)
Change Gear Assy
❹Capstan Motor Assembly
Rotor Gear
❷Capstan Cover
❶Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly ❶.
4) Remove the T soft assembly ❷, then the T soft arm ❸.

2. Mounting

1) Mount the T soft arm ❸ with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly ❷ with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly ❶ and rotate it toward the arrow 🅐 to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

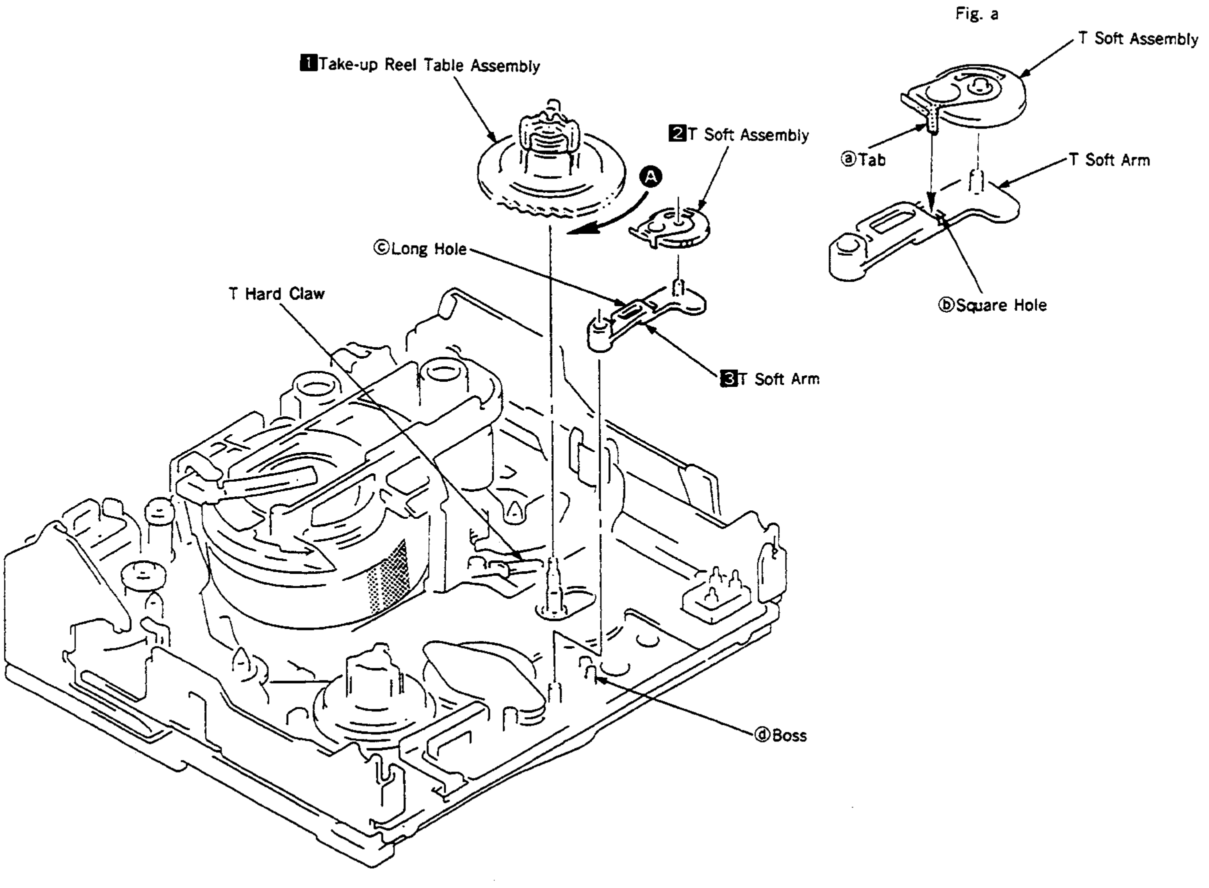


Fig. a
T Soft Assembly
❶Take-up Reel Table Assembly
❷T Soft Assembly
🅐
ⓐTab
T Soft Arm
ⓒLong Hole
T Hard Claw
ⓑSquare Hole
❸T Soft Arm
ⓓBoss

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the READY mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the READY mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

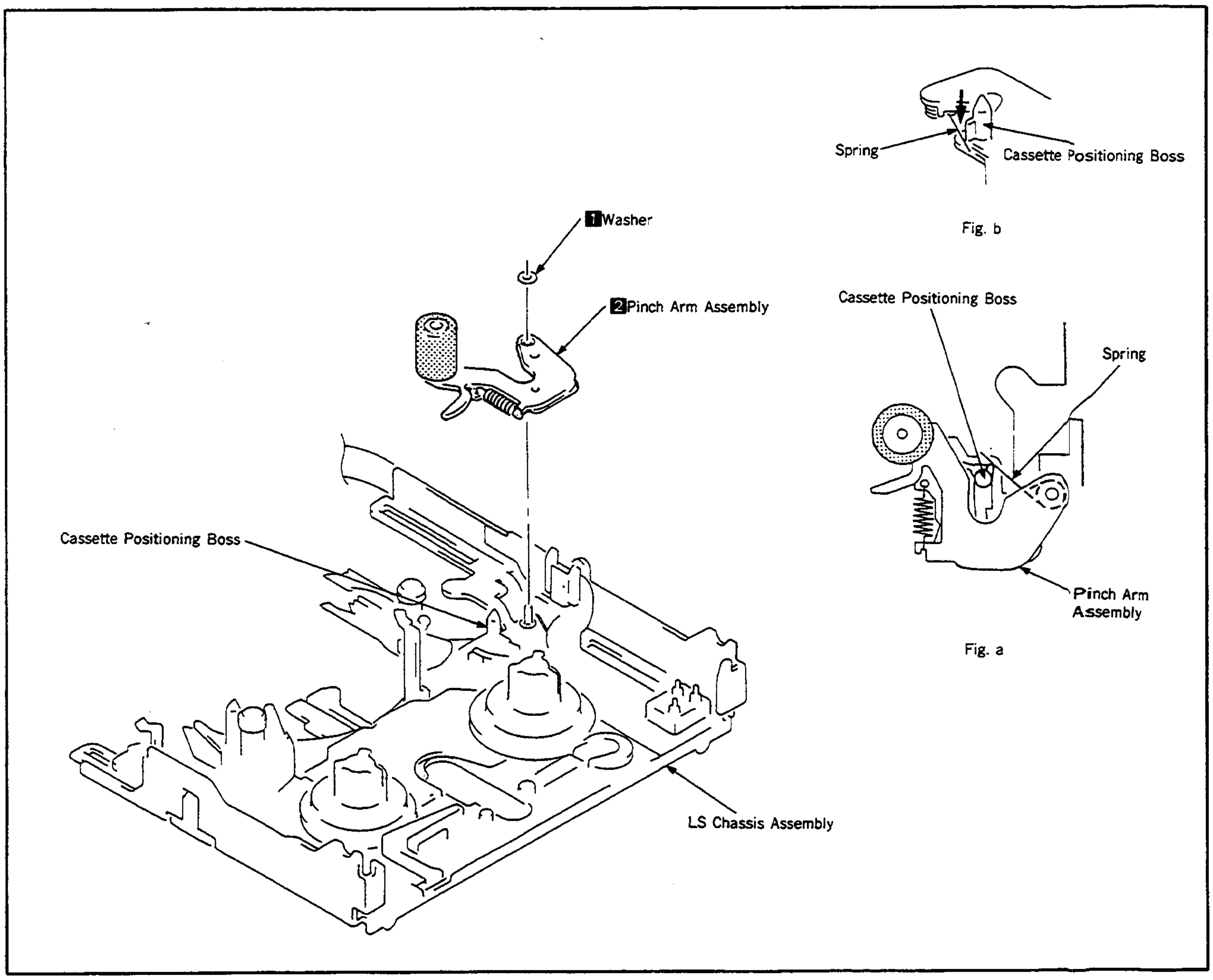

Spring
Cassette Positioning Boss
Fig. b
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
Fig. a
LS Chassis Assembly

Fig. 13

LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw ❶, TG-5 base holder ❷, and LS flexible board ❸.
5) Remove a lock washer ❹, then the gooseneck as sembly ❺.
6) Remove four screws ❻, then the LS chassis assembly ❼.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly ❼ on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws ❻.
6) Mount the LS flexible board ❸ and TG-5 base holder ❷,then tighten the screw ❶.
7) Mount the Gooseneck assembly ❺ and fix it with a washer ❹.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

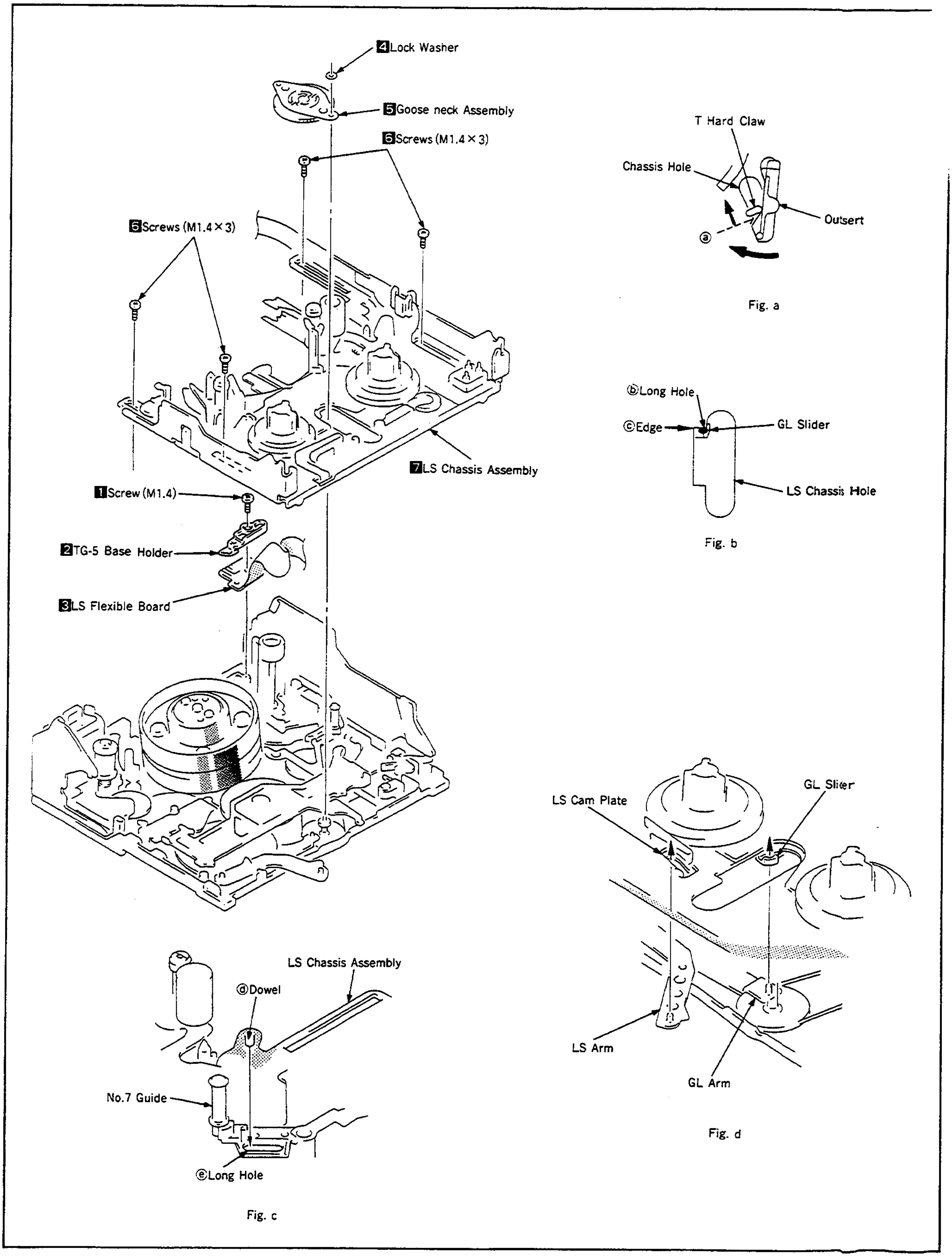

❹Lock Washer
❺Goose neck Assembly
❻Screws (M1.4×3)
❻Screws (M1.4×3)
❼LS Chassis Assembly
❶Screw (M1.4)
❷TG-5 Base Holder
❸LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm
LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole

Fig. a

Fig. b

Fig. d

Fig. c

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider 1 toward the arrow Ⓐ, and remove the guide base T assembly 2 and guide base S assembly 3 from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly 4, guide arm S assembly 5 and GL slider 1 from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly 2 and guide base S assembly 3 with the respective guide rails, push in the GL slider 1 toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

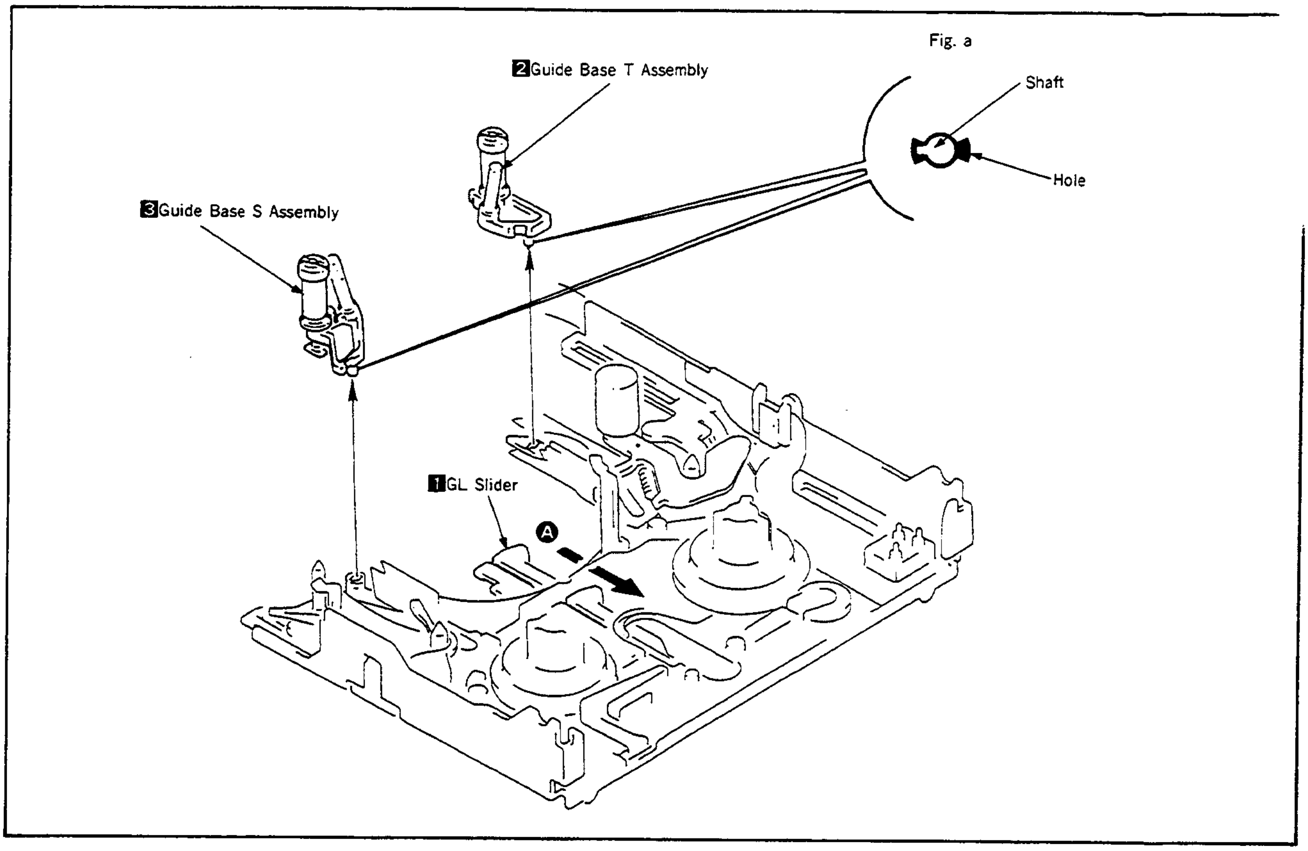


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
Ⓐ

Fig. 15

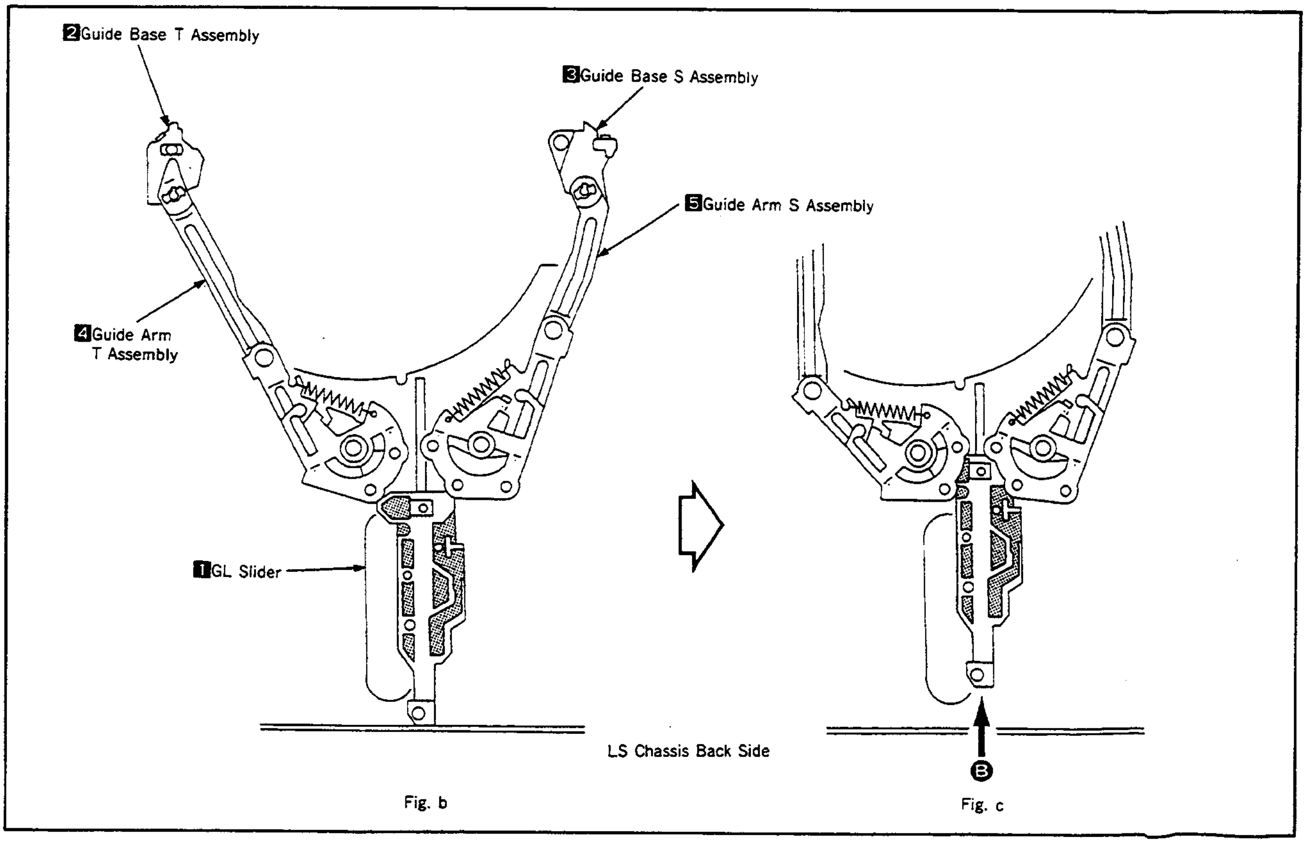

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
Ⓑ

Fig. b

Fig. c

Fig. 16

GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

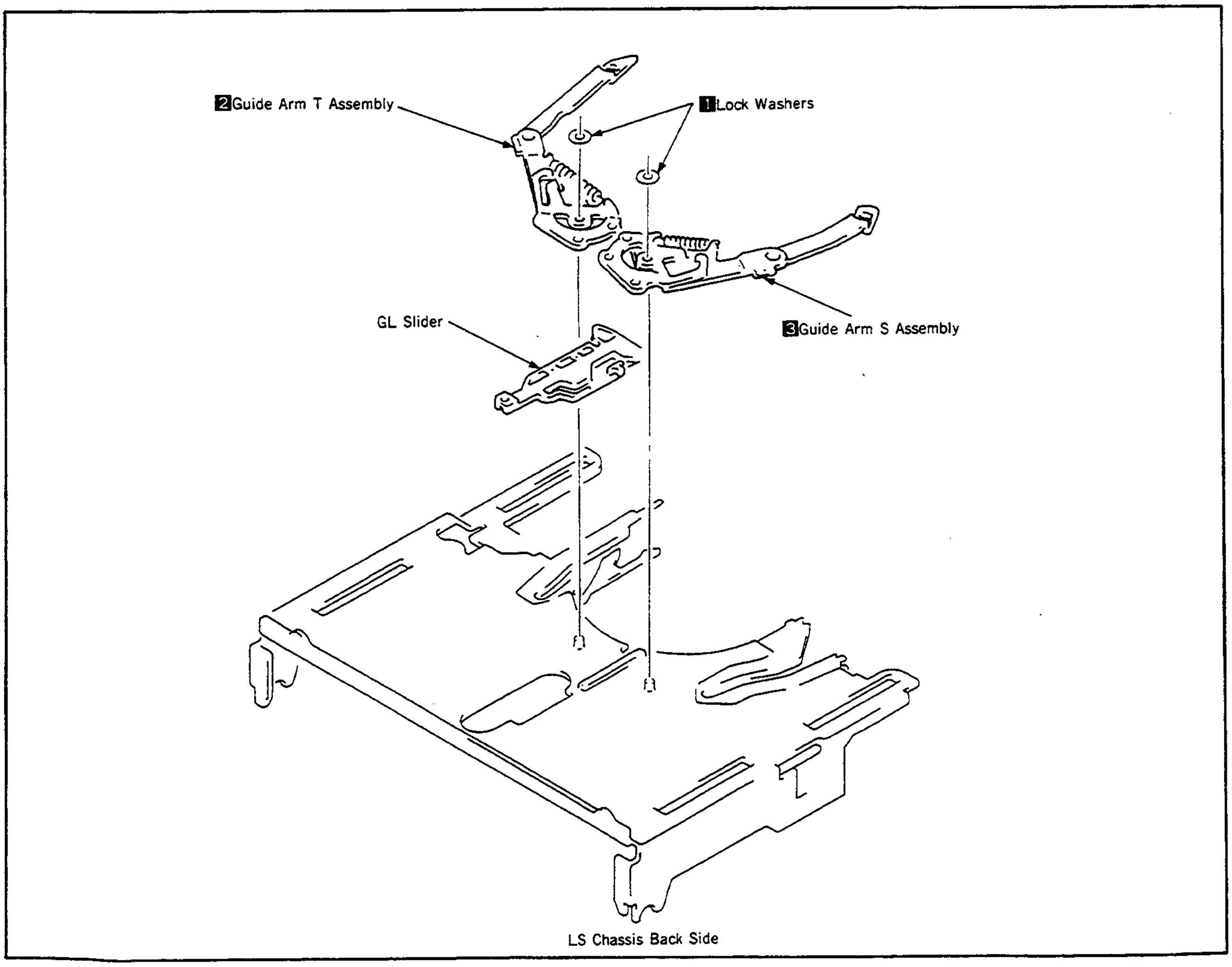


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw ❶, then the string ❷ from the supply reel table assembly ❸. For easy removal of string block ❹, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly ❸.
8) Remove a tension coil spring ❺.
9) Turn the TG-1 arm assembly ❻ up to a portion ⓒ of LS chassis hole in the arrow 🅐 direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake ❼ toward the arrow 🅑, mount thesupply reel table assembly ❸.
2) Route the string ❷ under the TG-1 arm asembly ❻, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow 🅐 (Fig. b).
3) Wind the string ❷ along the groove of supply reel t assembly ❸ (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block ❹ toward the arrow 🅒 and tighten the screw ❶ (Fig. a).
5) Engage the tension coil spring ❺ to the chassis hook.

Note : Confirm that the string ❷ is surely wound around the groove of supply reel table assembly ❸ (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

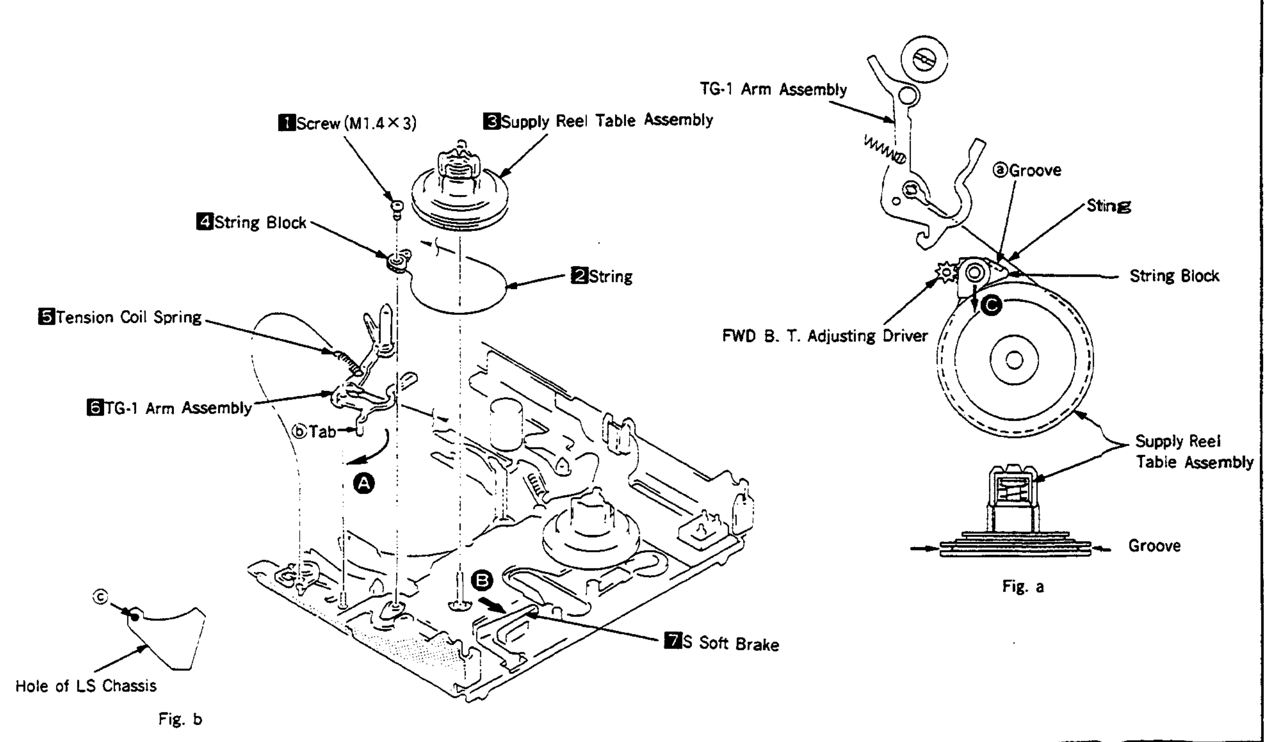

❶Screw (M1.4 × 3)
❸Supply Reel Table Assembly
❹String Block
❷String
❺Tension Coil Spring
❻TG-1 Arm Assembly
ⓑTab
🅐
🅑
❼S Soft Brake
ⓒ
Hole of LS Chassis
Fig. b
TG-1 Arm Assembly
ⓐGroove
Sting
String Block
🅒
FWD B. T. Adjusting Driver
Supply Reel Table Assembly
Groove
Fig. a

Fig. 18

3 . TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly ❶ .
2) Remove a compression coil spring ❷ .

2.Mounting

1) Insert a compression coil spring ❷ into the boss on chassis.
2) Rotate gently the TG-2 roller assembly ❶ until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

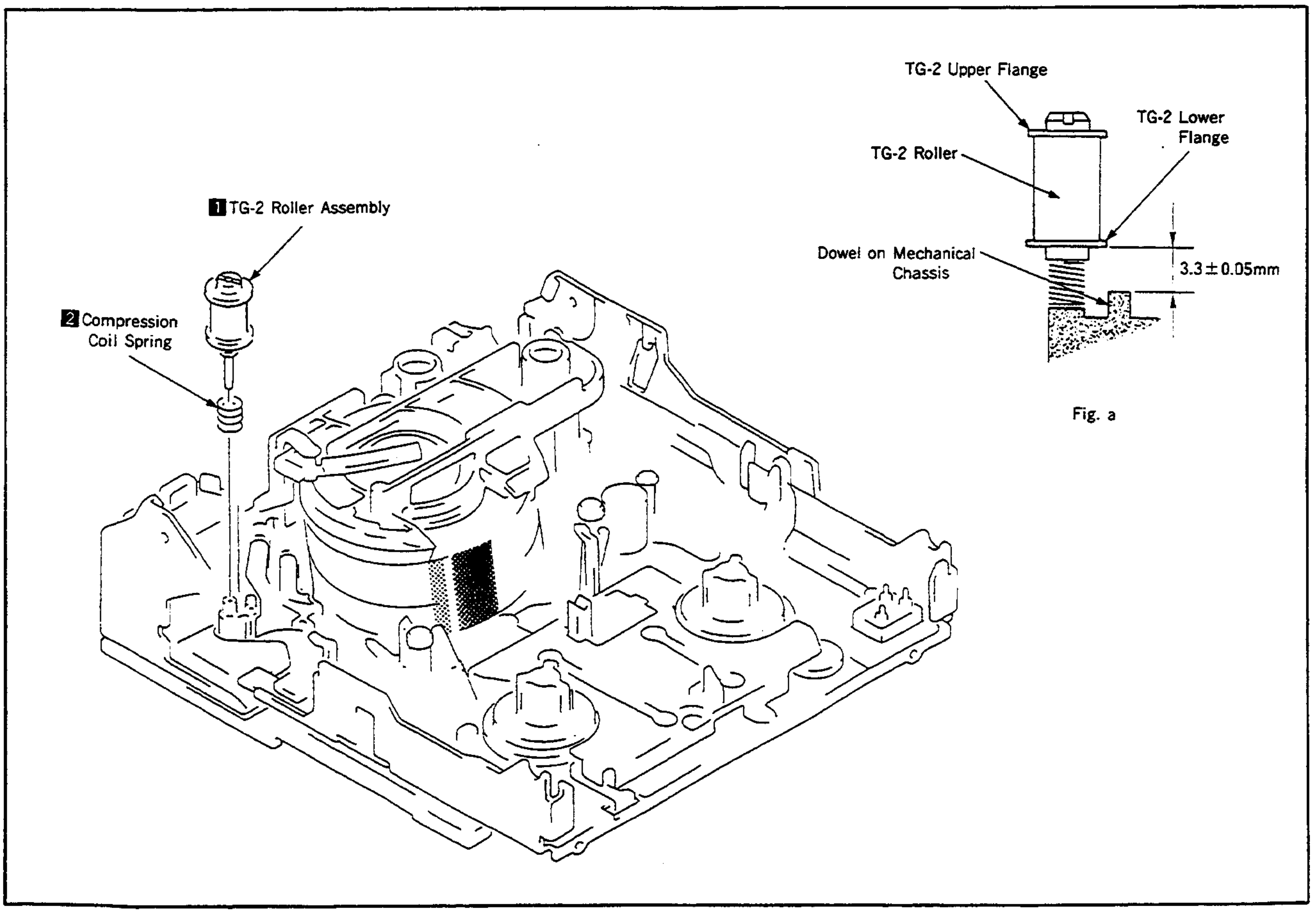

❶ TG-2 Roller Assembly
❷ Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm
Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring ❶ in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly ❷ from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly ❷ to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring ❶ to the mechanicalchassis.
   *Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

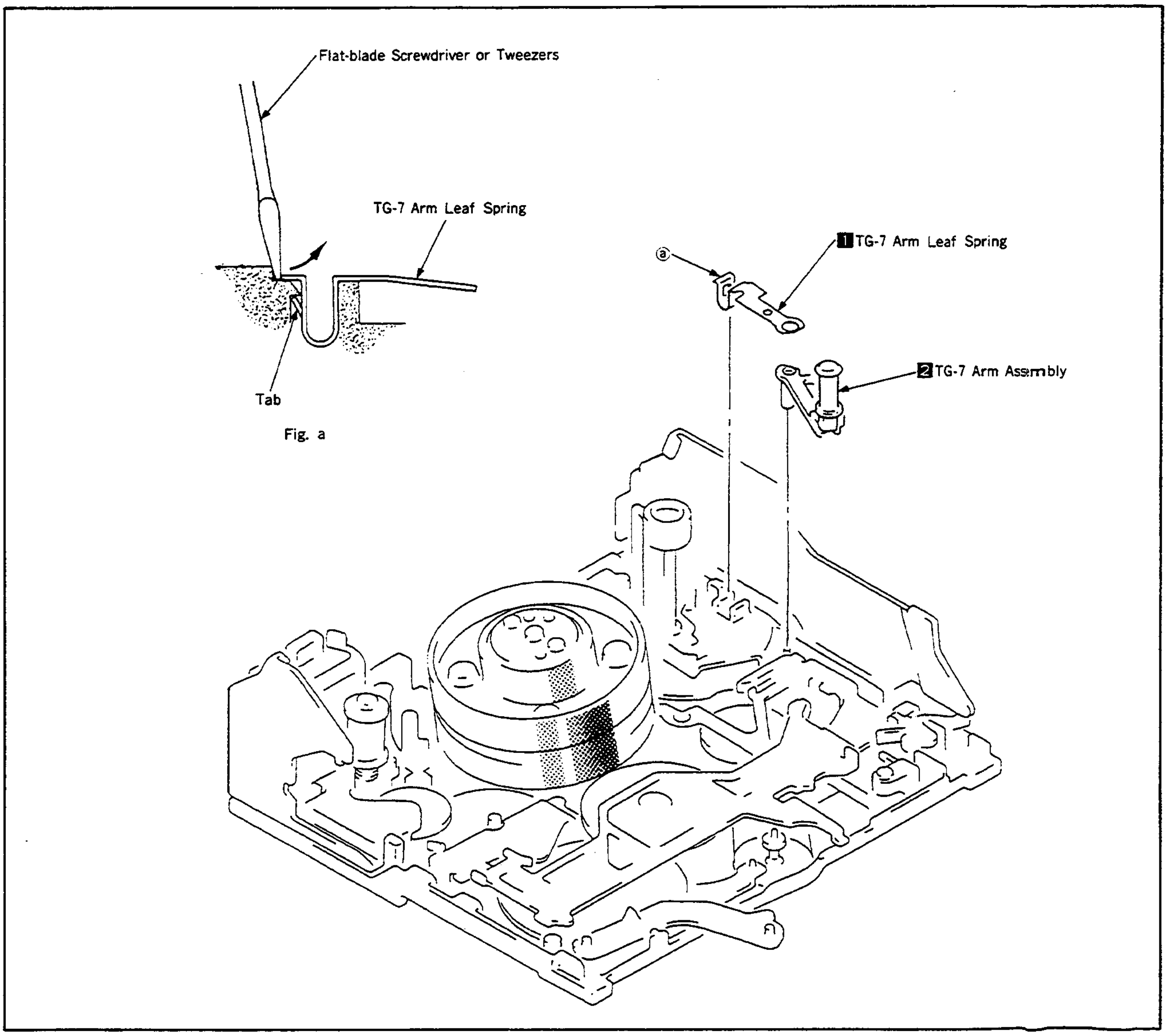


Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

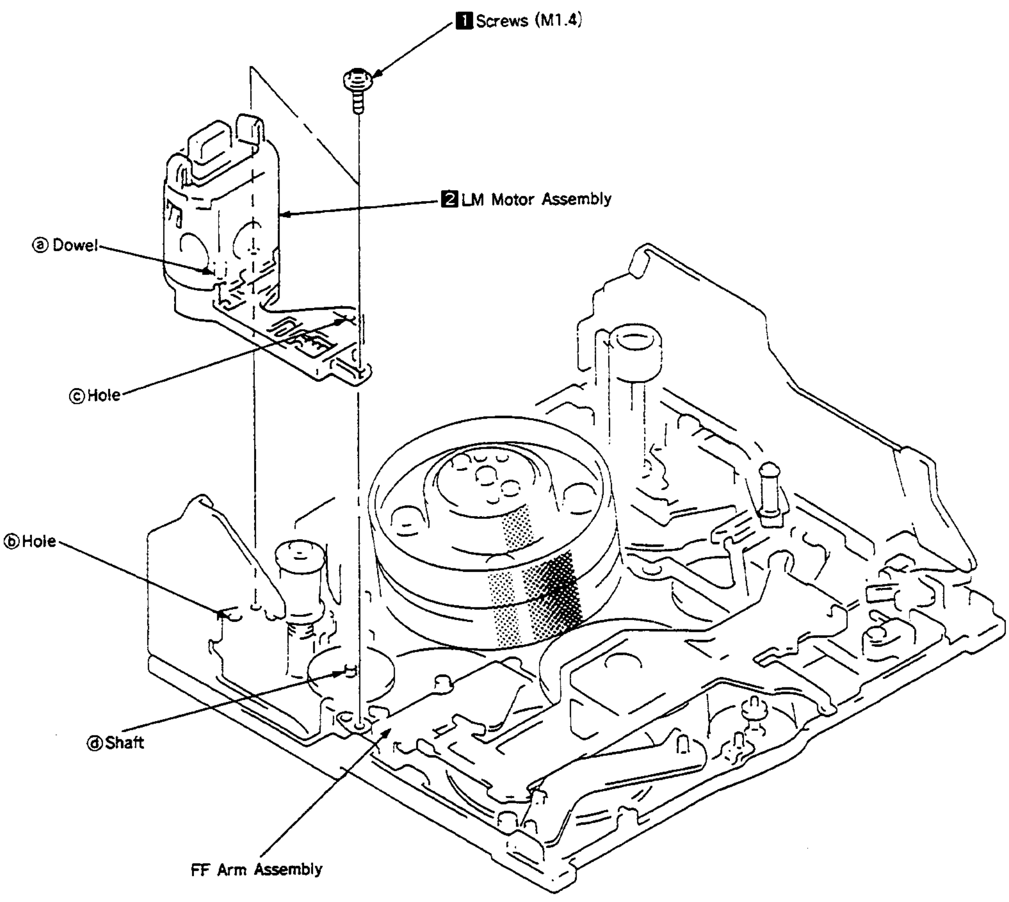


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm 1 from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller 2.

2. Mounting

1) Mount the LS arm 1 meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm 1 in arrow direction to confirm that the LS roller 2 is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

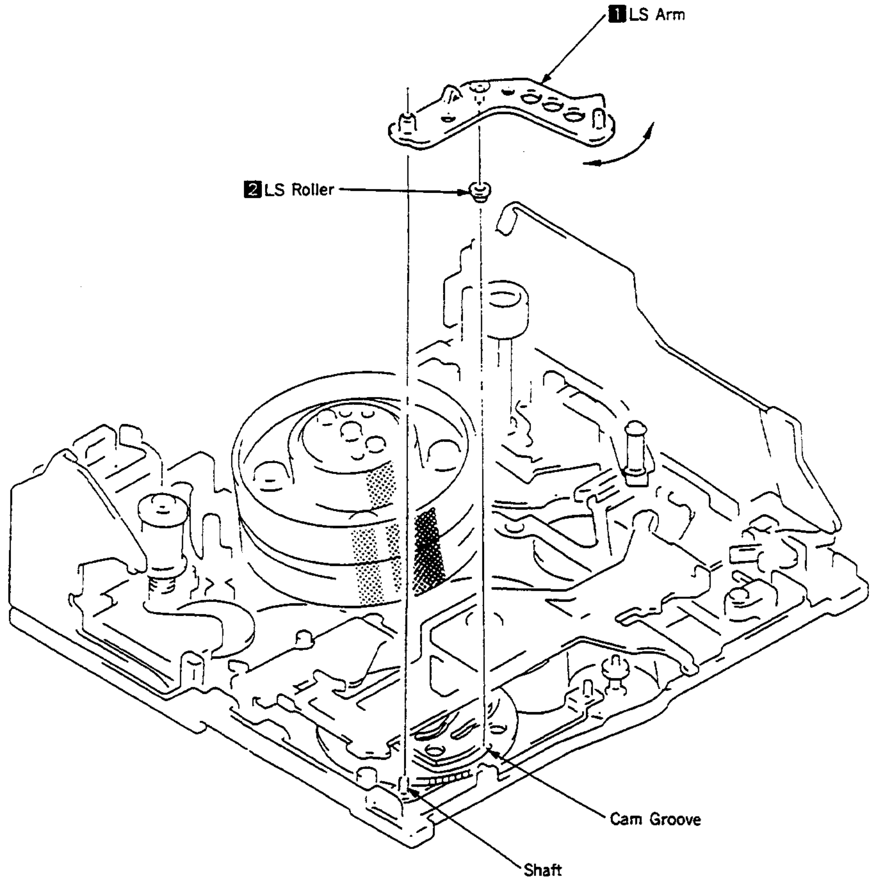


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

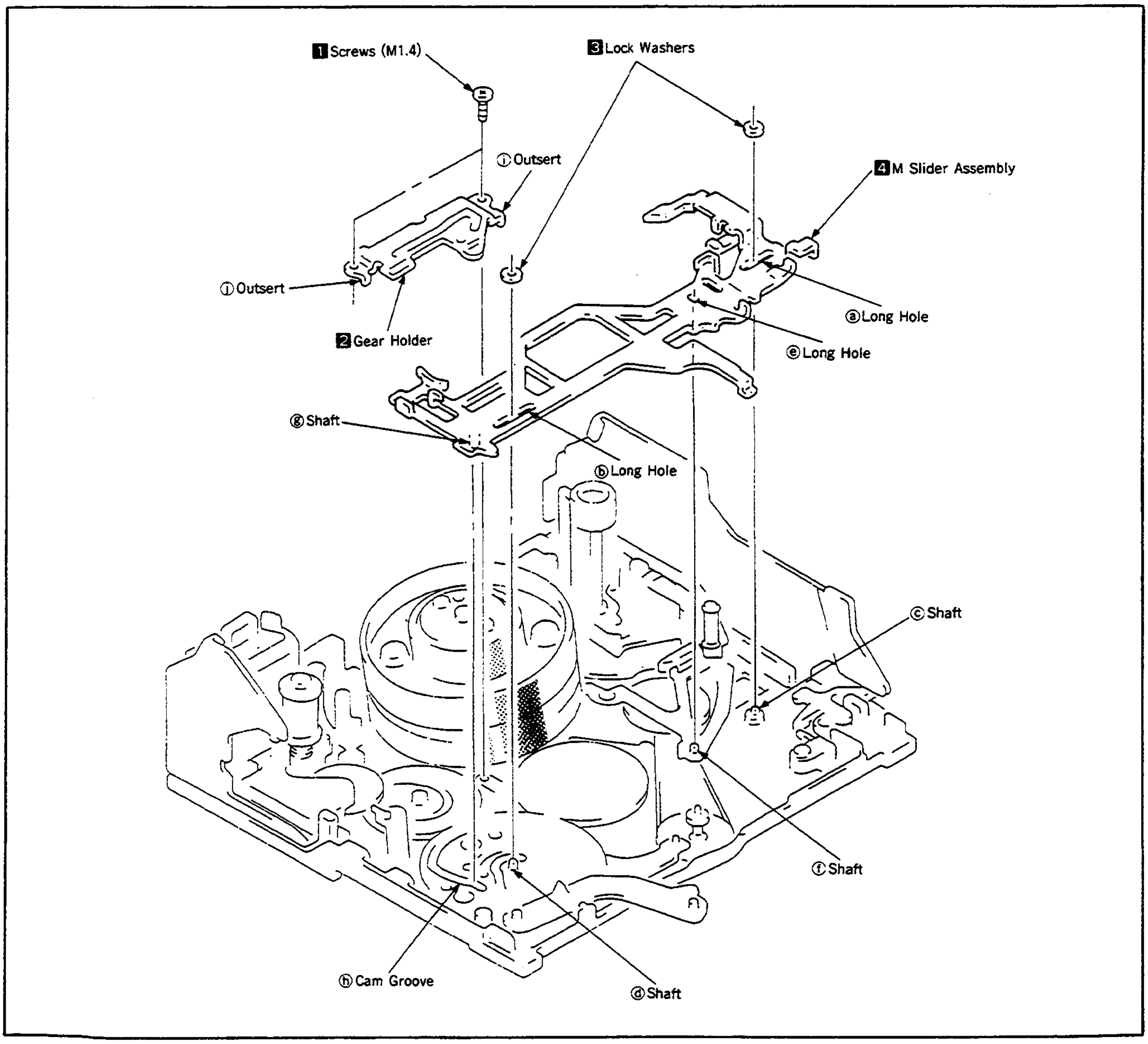

❶Screws (M1.4)
❸Lock Washers
ⓙOutsert
❹M Slider Assembly
ⓘOutsert
ⓐLong Hole
❷Gear Holder
ⓔLong Hole
ⓖShaft
ⓑLong Hole
ⓒShaft
ⓕShaft
ⓗCam Groove
ⓓShaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

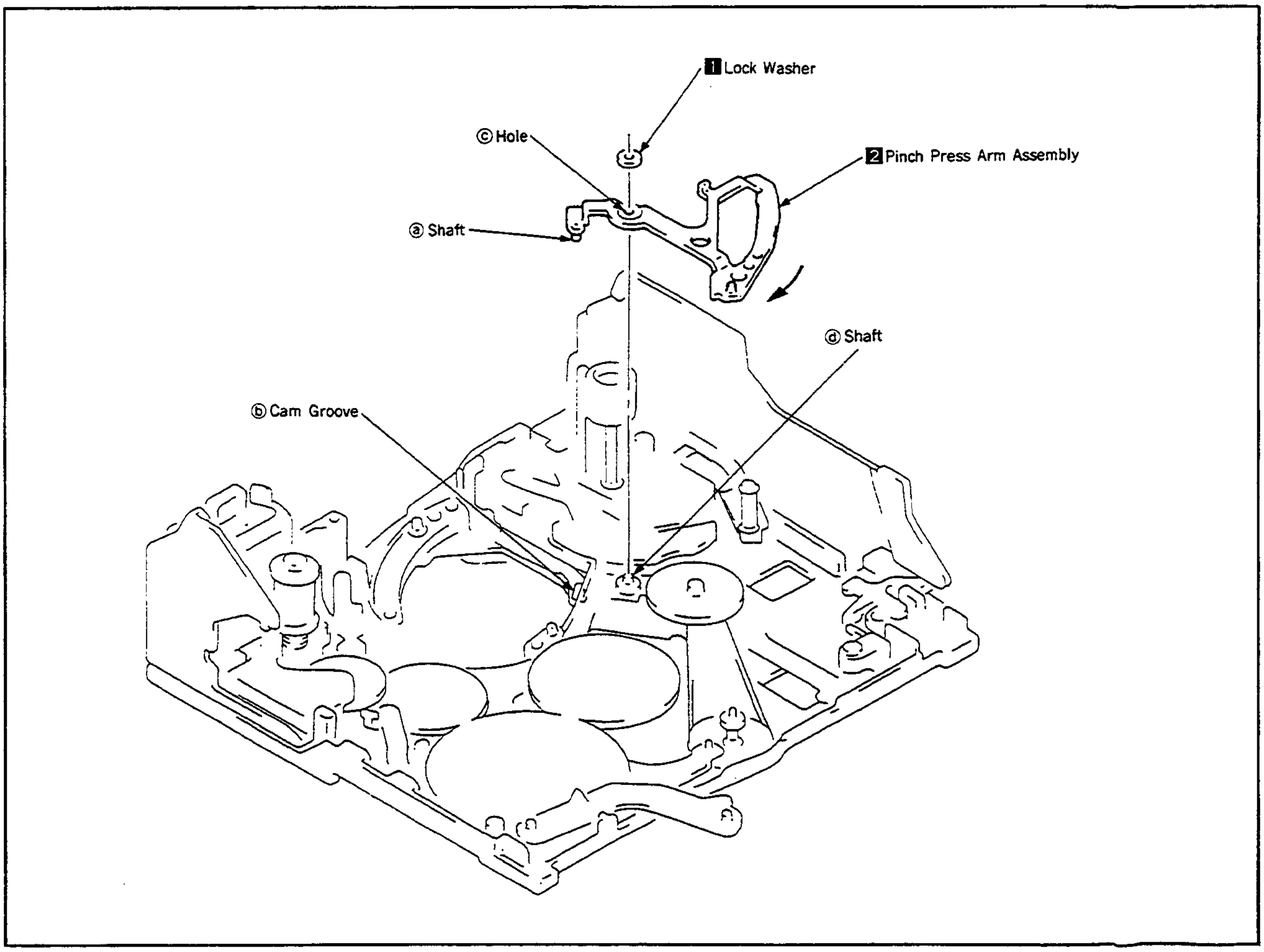


Fig. 24

. CAM (Fig. 25)

Removal

Referring to 1-1, remove the cassette compartment assembly.
Referring to 3-1, remove the Retainer, Gooseneck assembly.
Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ■.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ■, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

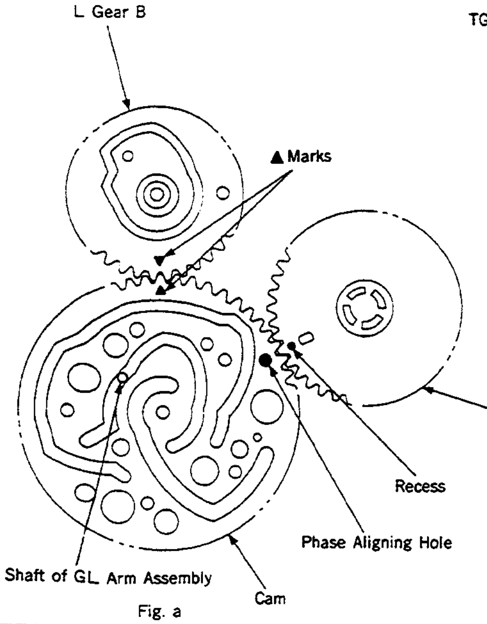


Fig. a

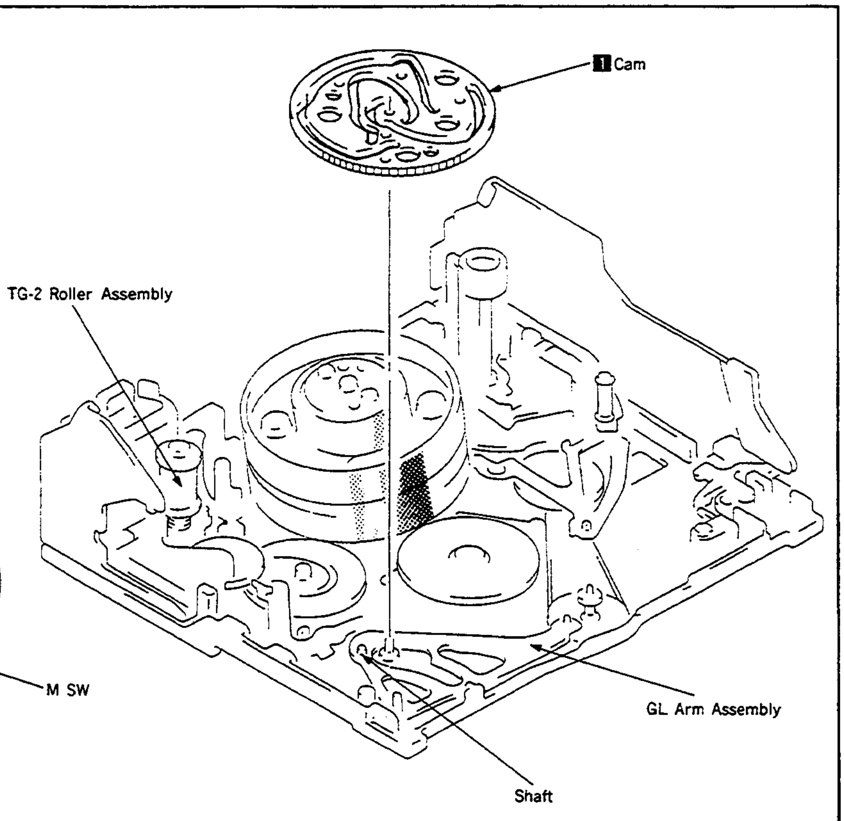


Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly **1**.

2. Mounting

1) Mount the GL arm assembly **1** with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

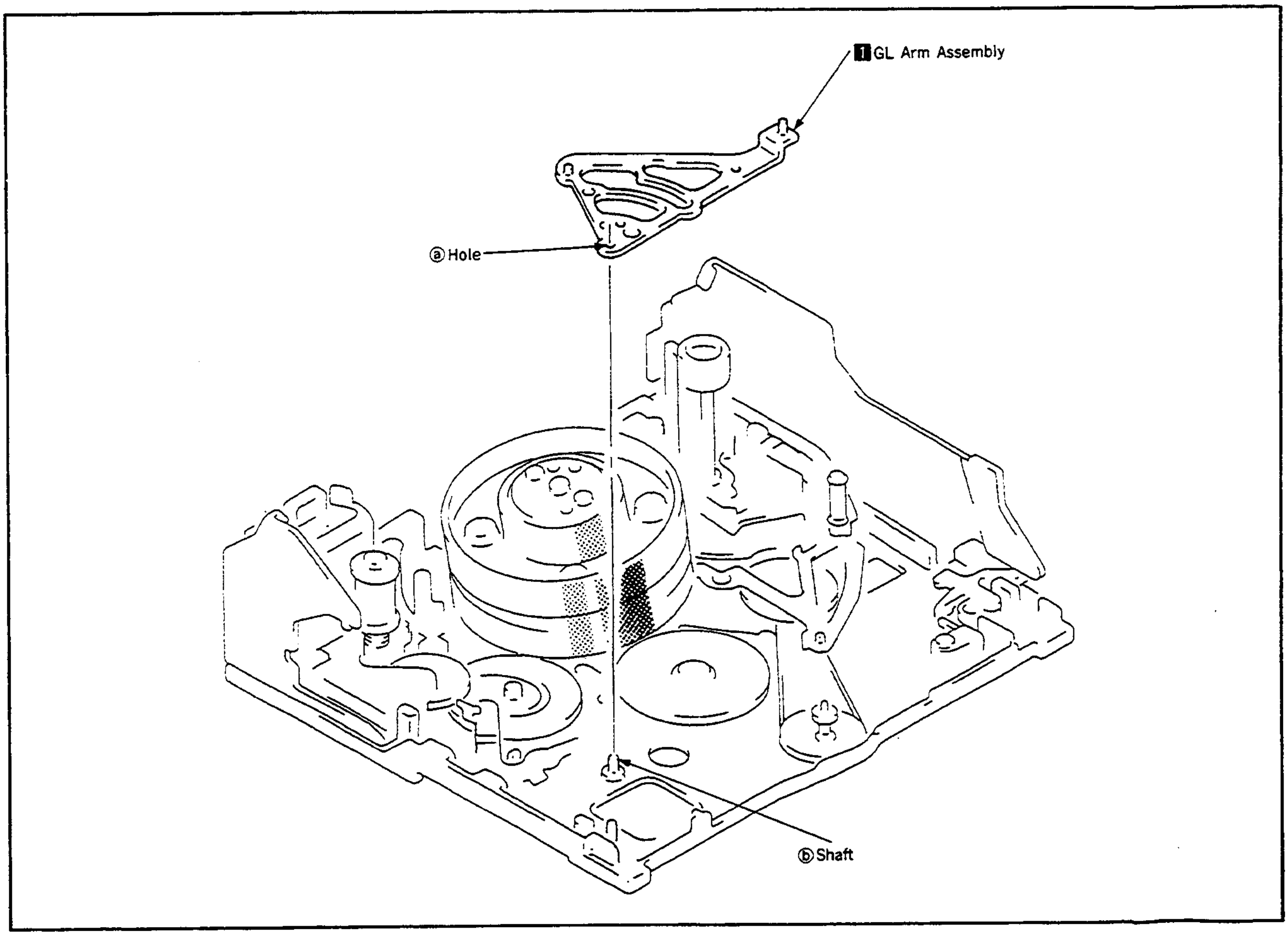


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

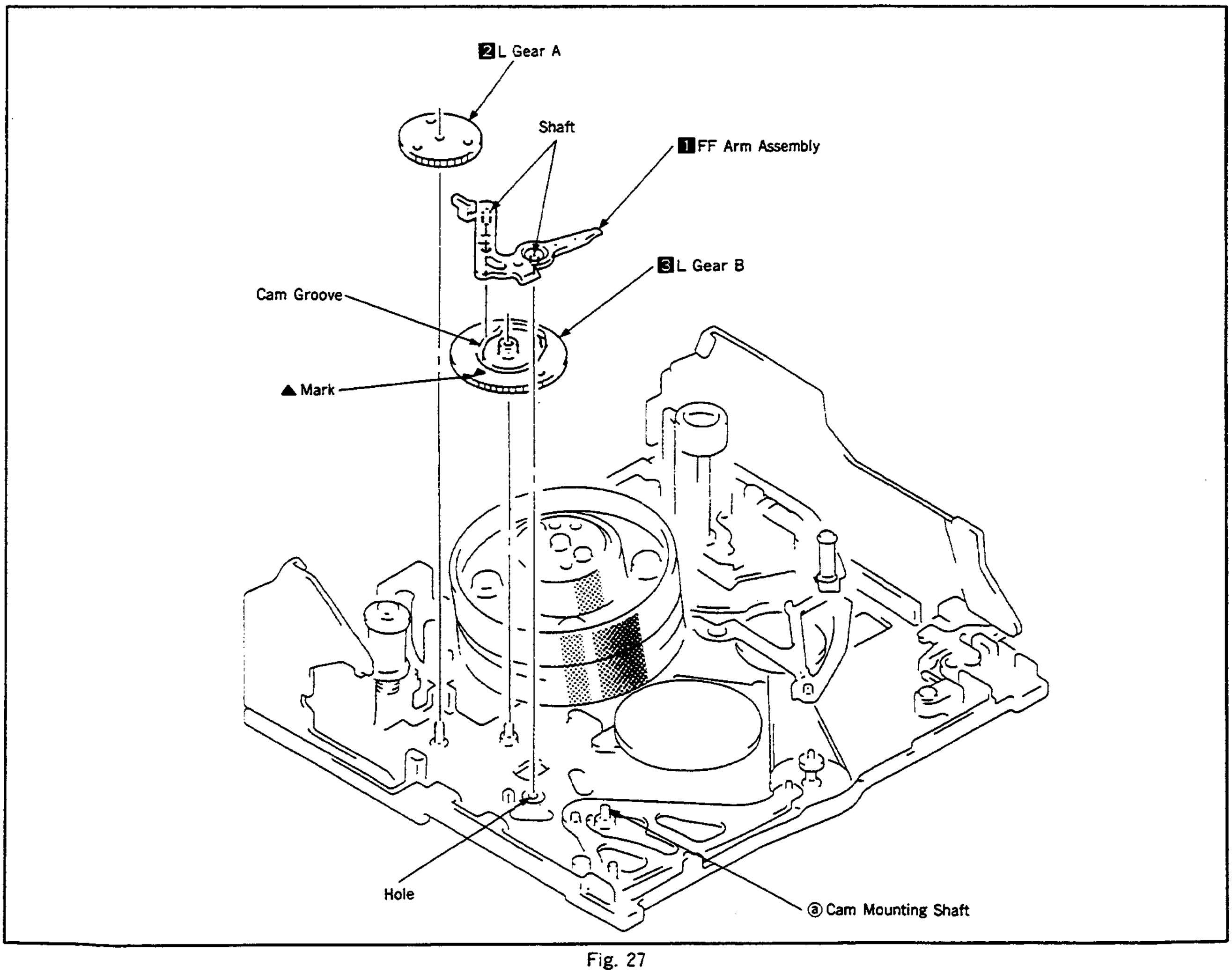


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer 1, then remove together the Change gear assembly 2, relay belt 3 and relay pulley 4.

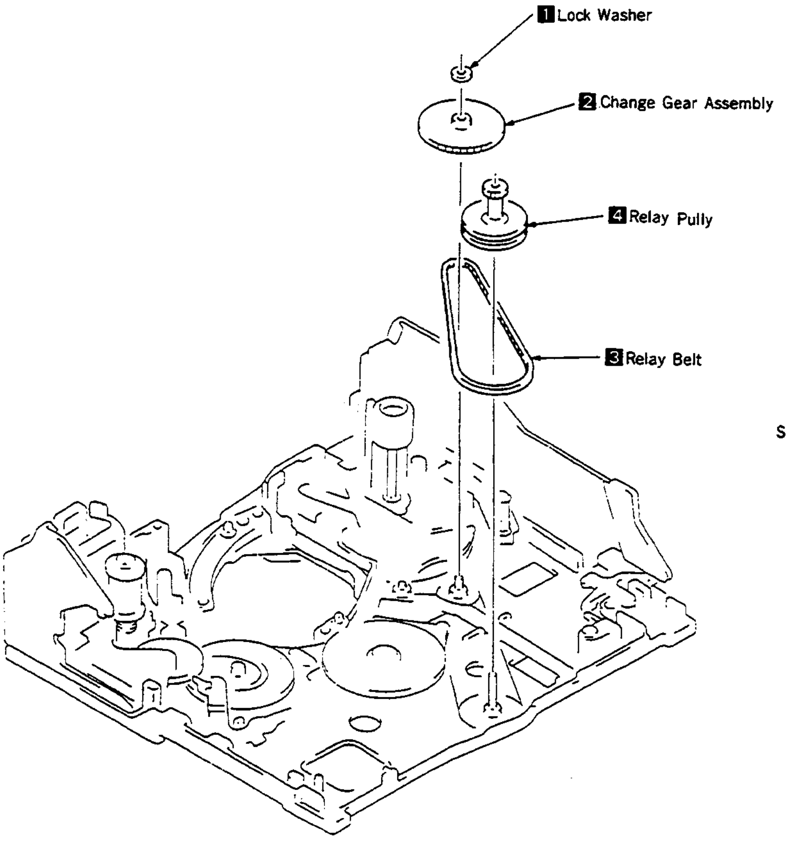
2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt 3 to the relay pulley 4 and Change gear assembly 2, mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer 1.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.



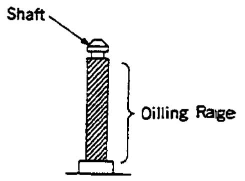


Fig. a

Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws 1 (Fig. 29).
2) Mount the jig 2 (Ref. No. J-10) with the two supplied screws 3, then screw the attached hexagon socket screws 4 to the jig 2. The rotary upper drum 5 will move upward and come off (Fig. 30).

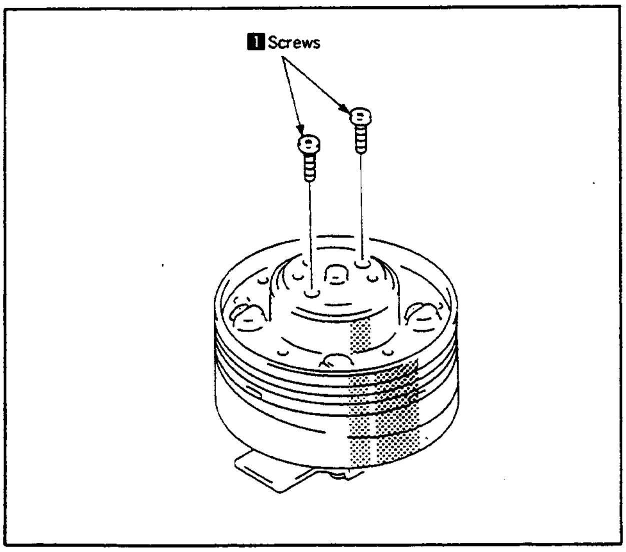


Fig. 29

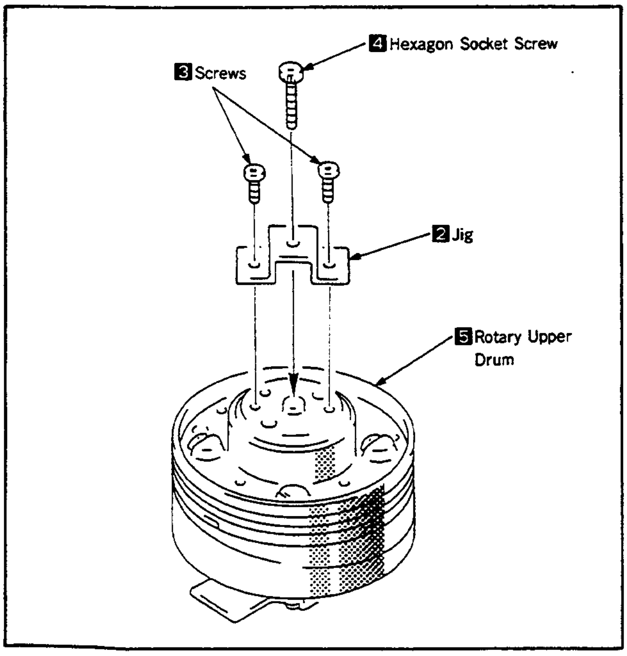


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum 5 surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig 6 (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum 5 by passing the jig through its positioning hole 7. (Fig.31)
3) Remove the jig 6 and push down the rotary upper drum 5 gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws 1 alternately (Fig.29).
4) Insert the jig 6 into the positioning hole 7 again and confirm that it goes in smoothly. If it does not, loosen the two screws 1, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws 1.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

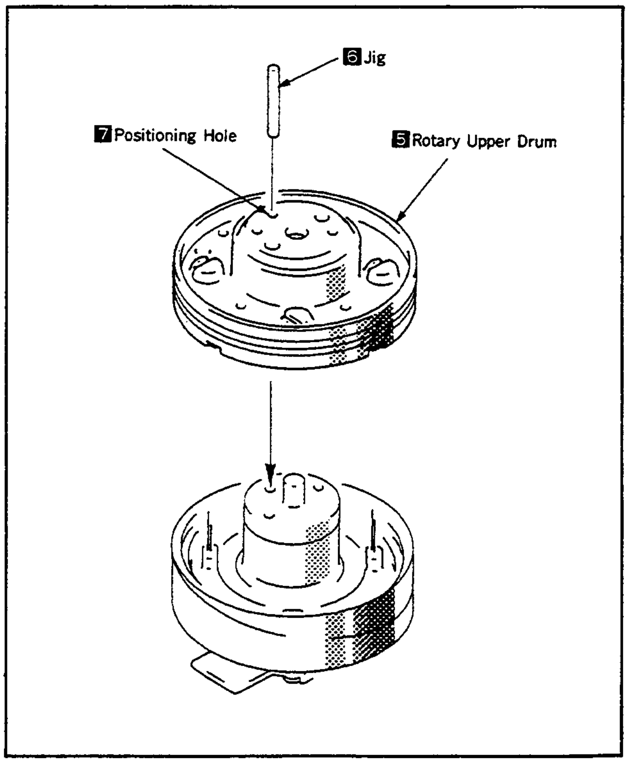


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw **1**.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw **1**.

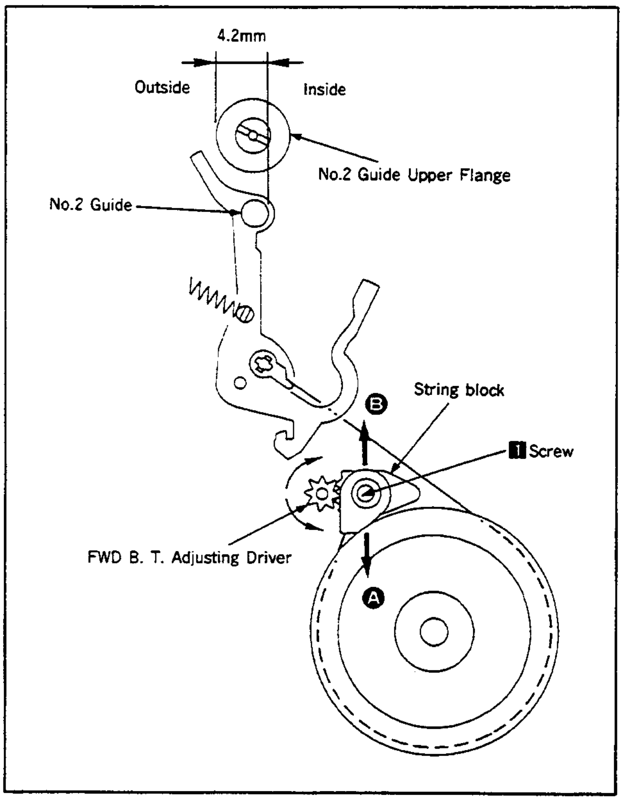

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
1 Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

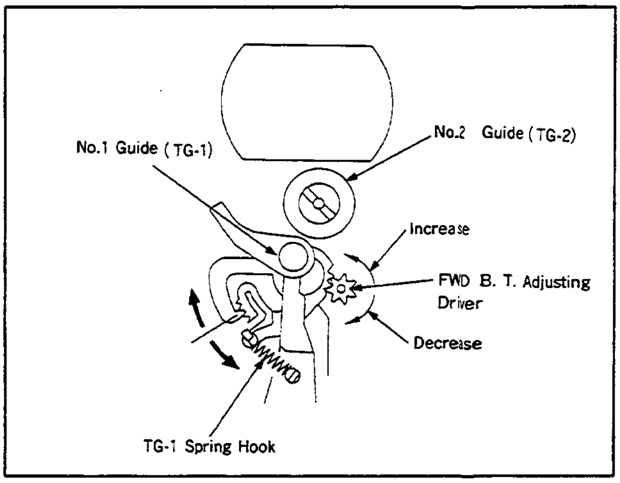

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.

Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series

Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

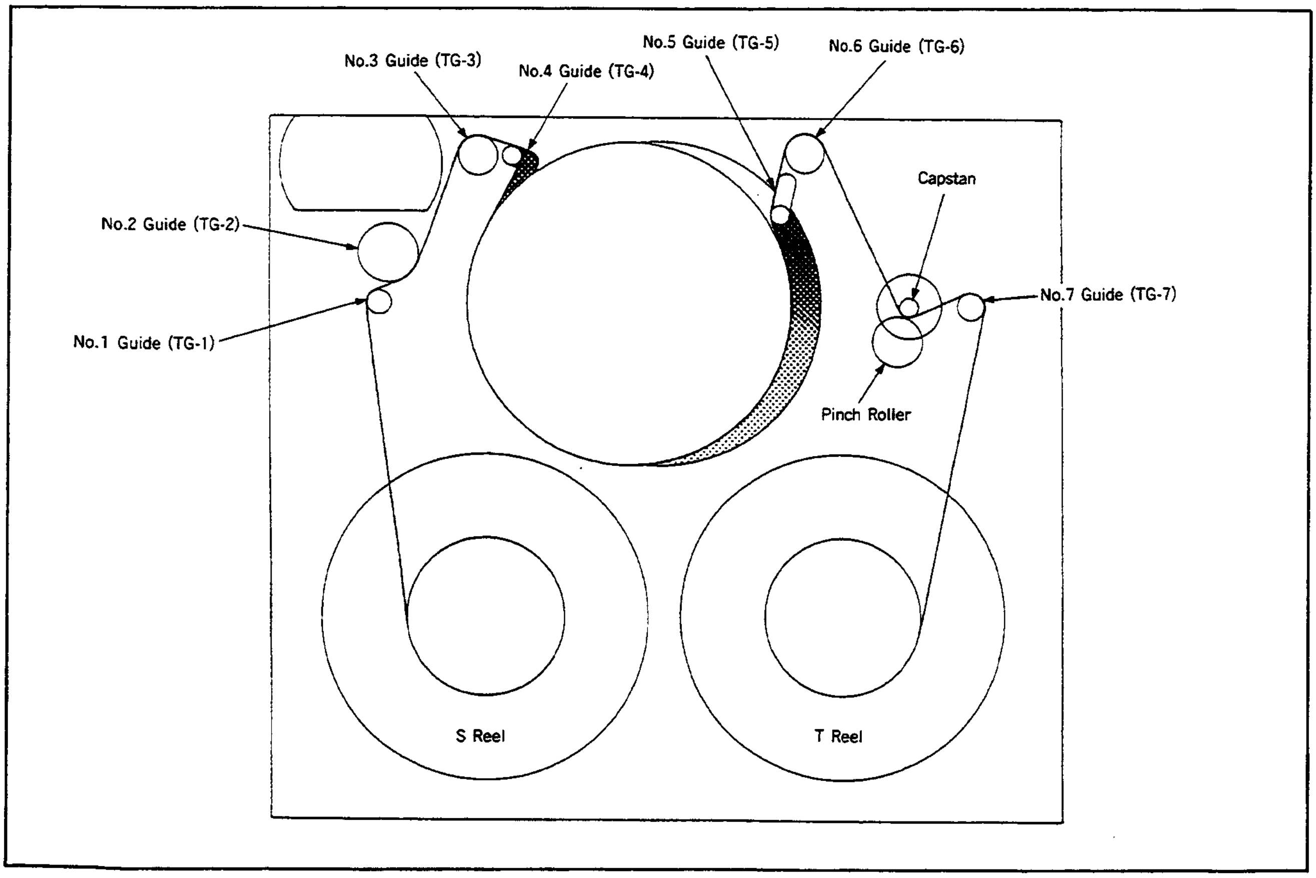


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]
The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).
Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

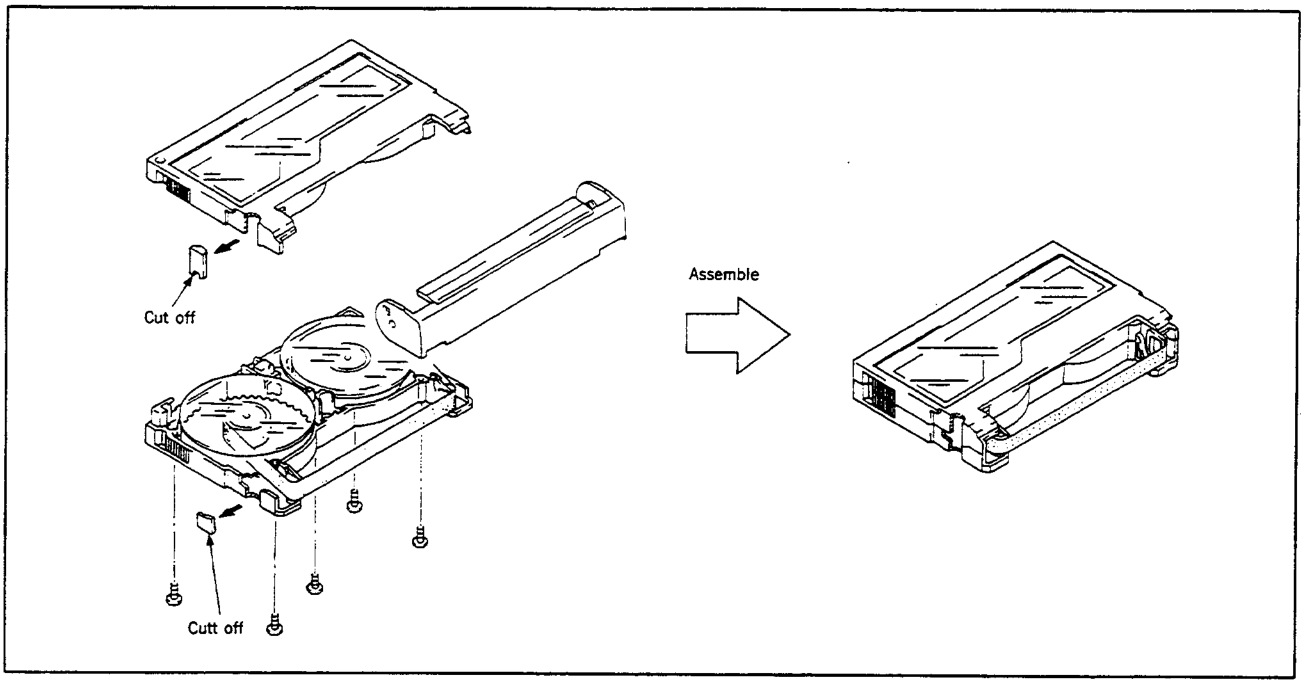


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
      CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
      CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

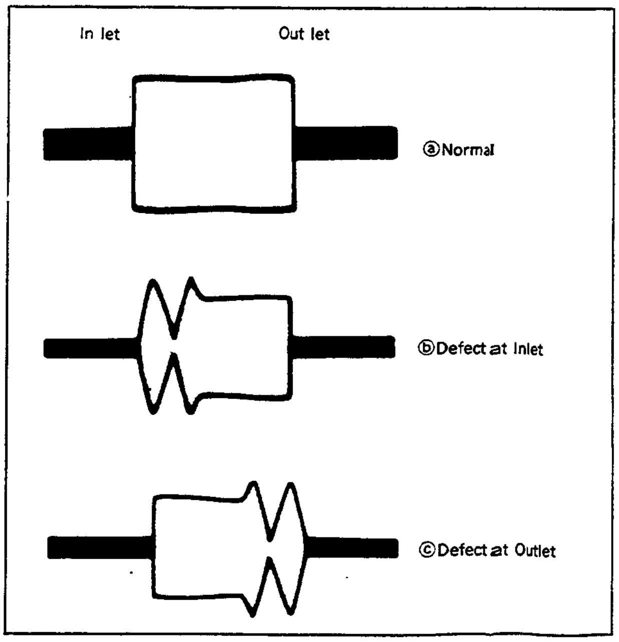


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

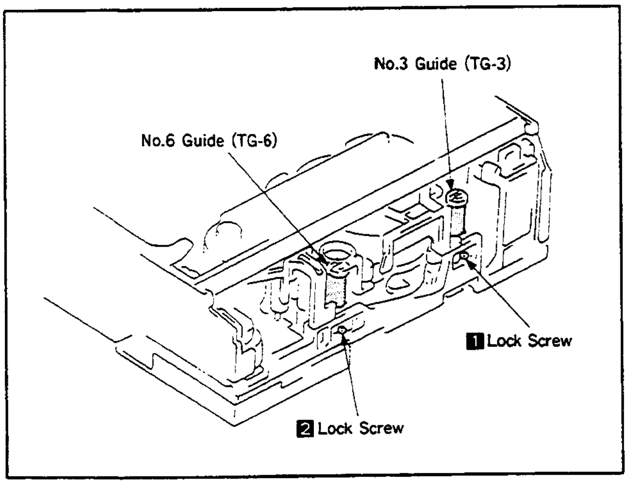


Fig. 36

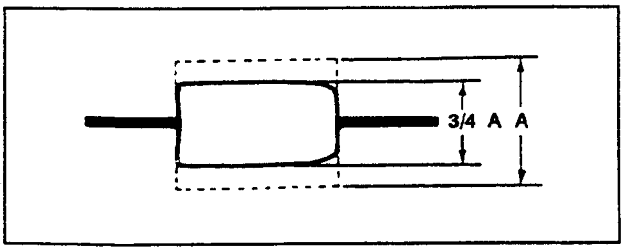


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

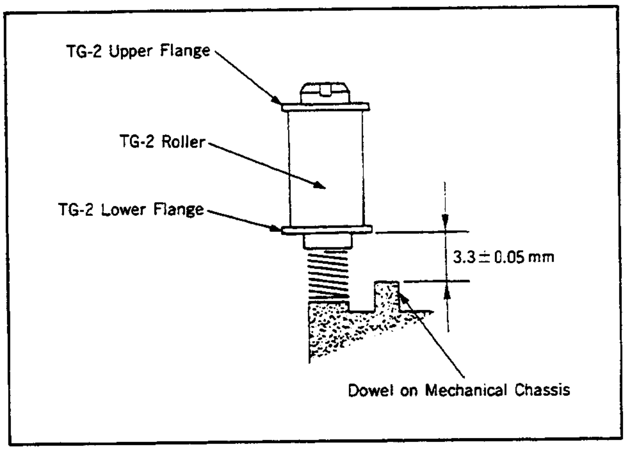


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange **2** of the No.2 guide (TG-2) **1** (Fig. 39). If it is, turn the upper flange **3** of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange **3** of the No. 2 guide (TG-2) **1** 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

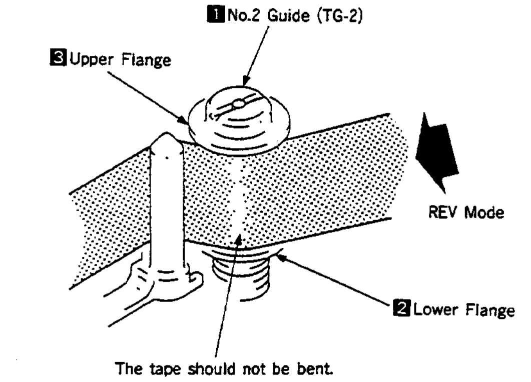


Fig. 39

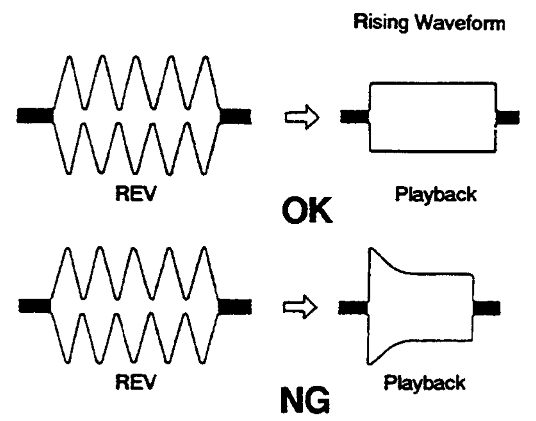


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) **1** and the capstan **2**. If it is, turn the hight adjusting screw **4** of the No.7 guide (TG-7) **3** until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan **2** and the hight adjusting screw **4** of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) **3** until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) **1** and the capstan **2** is 0.3mm or less, adjustment can be considered completed.

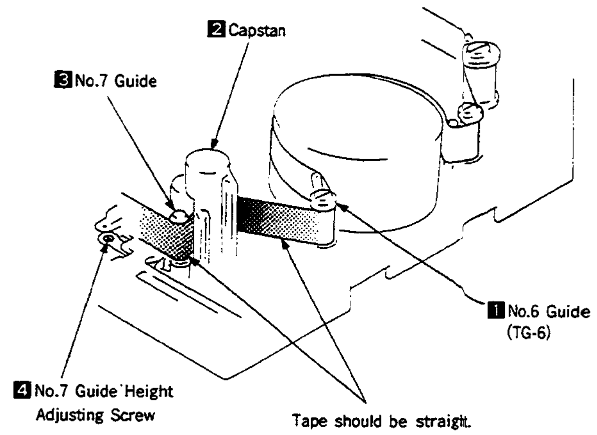


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig.42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

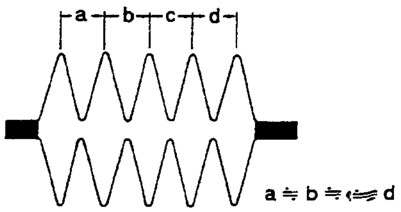


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

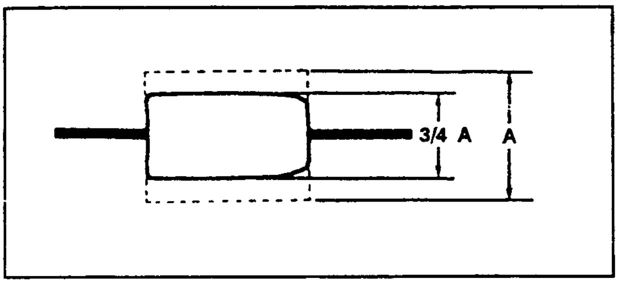
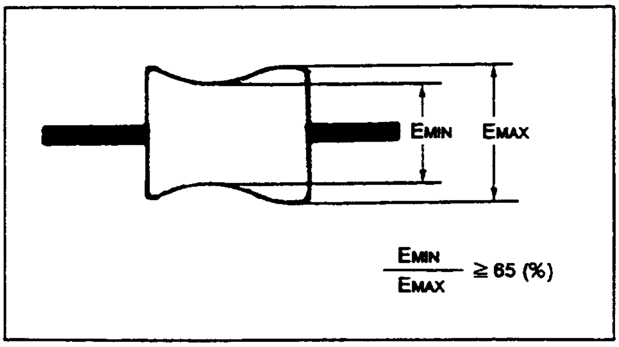
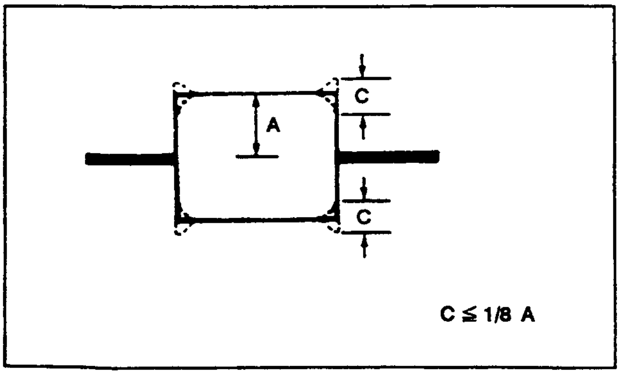


Fig. 43



$$\frac{E_{MIN}}{E_{MAX}} \geqq 65\ (\%)$$

Fig. 44



$C \leqq 1/8\ A$

Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

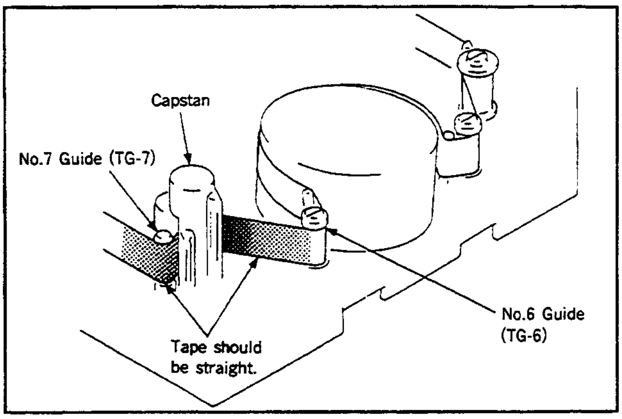

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

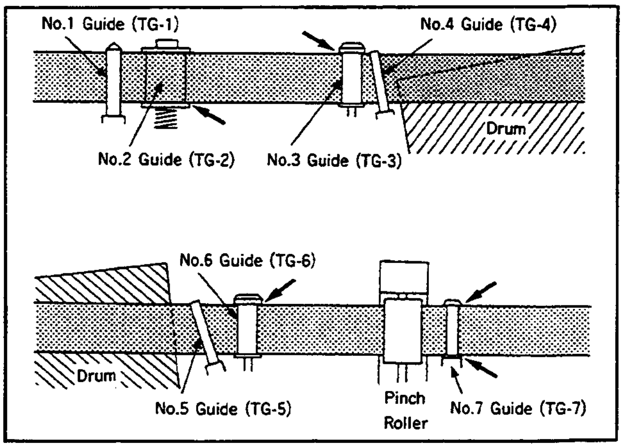

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM
SUPPLIMENT-2

Video 8

⟨Connection of Mode Selector IV Conversion Connector⟩

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

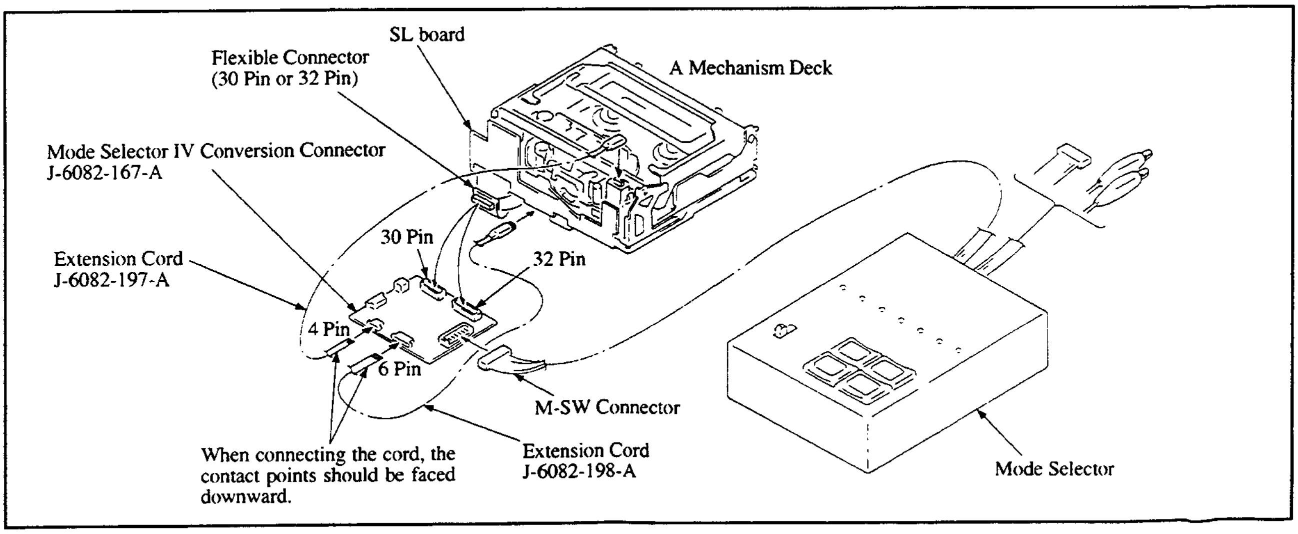
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

(CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477))

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
32 Pin
Extension Cord
J-6082-197-A
4 Pin
6 Pin
M-SW Connector
When connecting the cord, the contact points should be faced downward.
Extension Cord
J-6082-198-A
Mode Selector

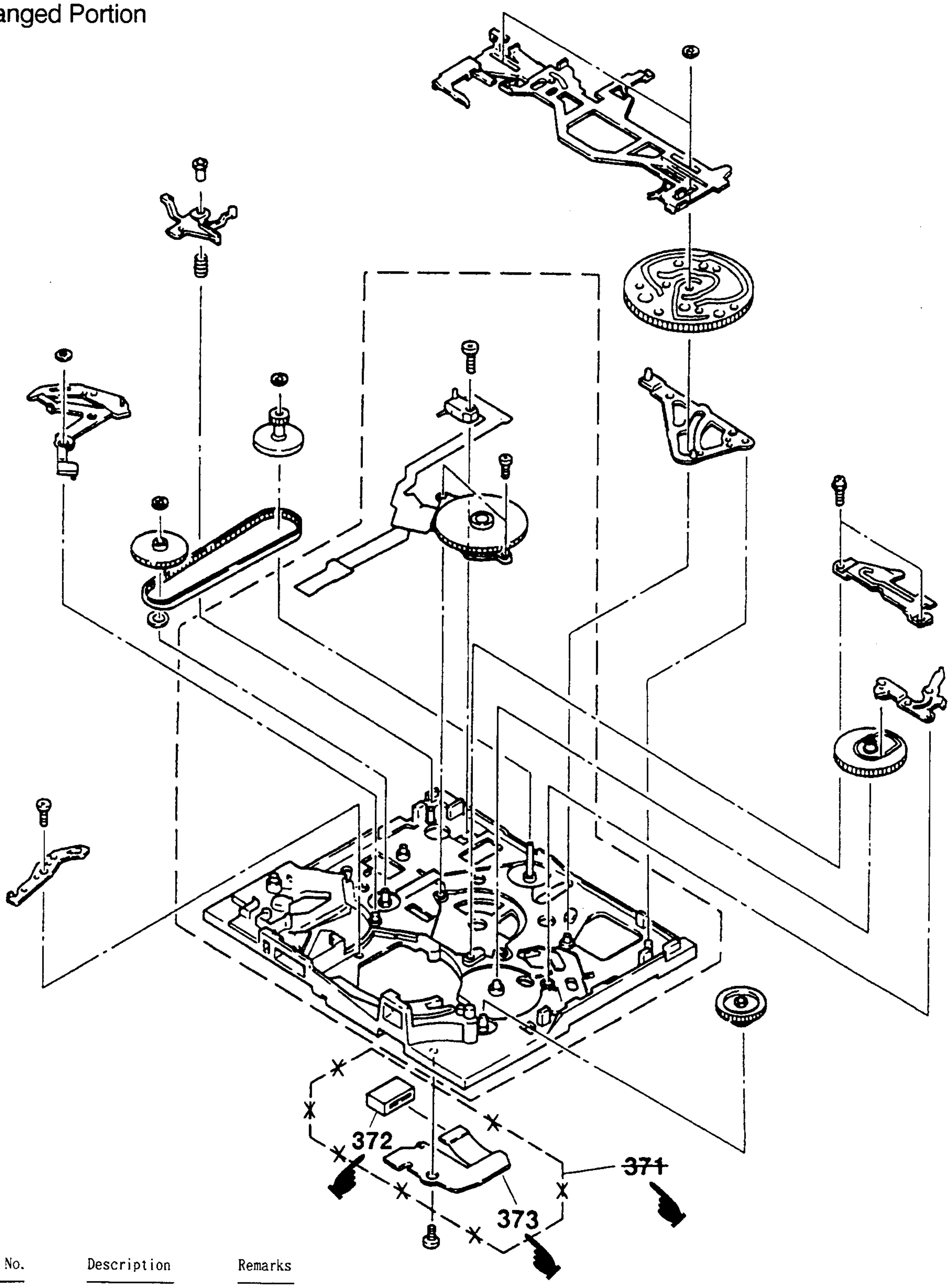
⟨CORRECTION⟩

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➜	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~	☛
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD	☛

9-973-199-84

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